Vol. 904 Number 4

OFFICIAL GAZETTE

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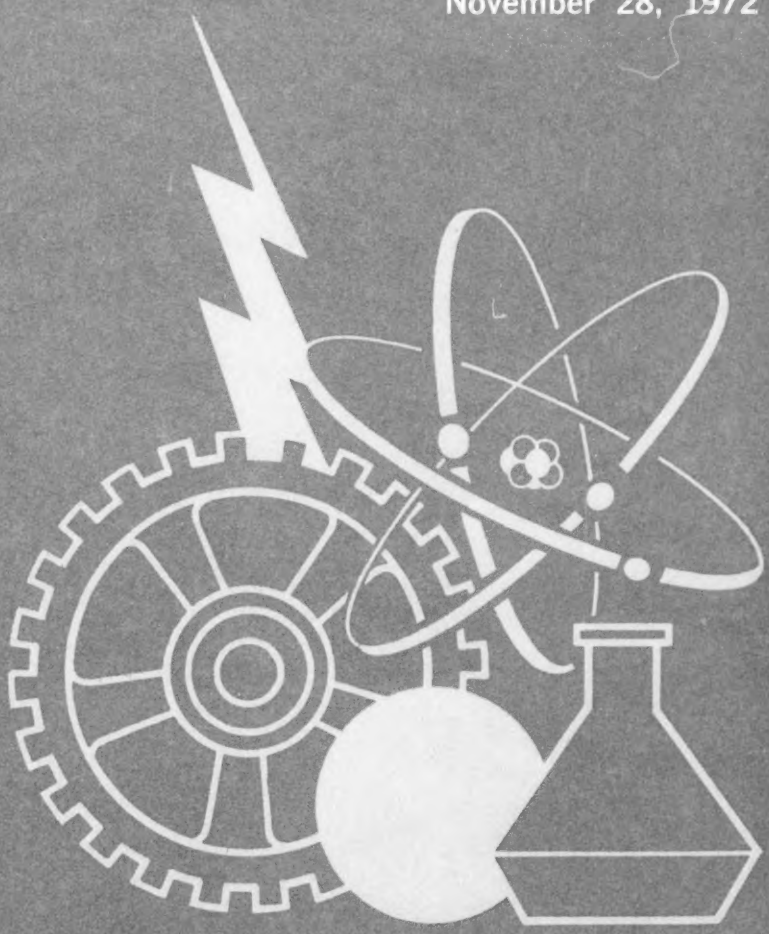
PATENTS

November 28, 1972



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Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 28, 1972 Volume 904 Number 4

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PATENT OFFICE NOTICES

Availability of Certain Abandoned Applications for Inspection and Copying

Pursuant to settlement of litigation with the United States, the Department of Health, Education, and Welfare announces that the following abandoned patent applications relating to Compositions for Limiting Dehydration and Fatigue During Periods of Physical Exertion are available for inspection and copying by any member of the public:

Serial Number 130,780, filed Apr. 2, 1971;
Serial Number 707,750, filed Feb. 23, 1968; and
Serial Number 644,318, filed June 7, 1967.

NORMAN J. LATKER,
Oct. 30, 1972. *Chief, Patent Branch.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases."

Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before December 22, 1972.

Hart, H. Roger, McCarthy & McCarthy, Toronto-Dominion Centre, P.O. Box 48, Toronto 111, Ontario, Canada
Jones, Owen J., Carver & Co., 1662 W. Eighth Ave., Vancouver 9, British Columbia, Canada
Miller, Paul R., Craig & Antonelli, 909 Watergate Office Bldg., Washington, D.C. 20037
Nielsen, Andres H., 2390 Cedar Lane, Vienna, Va. 22180
Rothenberg, Jeff, Xerox Corp., Crystal Mall Bldg. 1, 1911 Jefferson Davis Hwy., Arlington, Va. 22202

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,463,280, Kaehni and Kaehni, SPECTROSCOPE GRATING HAVING SPACED ZONES OF DIFFRACTION LINES, **filed** Apr. 23, 1969, D.C. Md. (Baltimore), Doc. 20693–C, *Frank J. Kaehni and Marie Kaehni* v. *Diffraction Company.* Judgment, patent not infringed, June 6, 1972.

2,495,142, E. G. Seary, TRANSPARENCY MOUNTS AND METHOD OF MAKING SAME, **filed** June 17, 1957, D.C., S.D.N.Y., Doc. C–121–291, *Eugene G. Seary* v. *Emil Koudelka, Inc.* Filed opinion holding claim 4 to be valid and dismissing complaint as to contributory infringement. Apr. 6, 1960. Filed order that this case was settled following appeal in 1960. The file is closed, Apr. 11, 1972.

2,642,679, F. J. Zamboni, ICE RINK RESURFACING MACHINE, **filed** May 15, 1968, D.C., S.D.N.Y., Doc. 68–C–1998, *Frank J. Zamboni* v. *Eugene V. Capalbo, also known as Gene Parker.* Stipulation and order of discontinuance without prejudice, June 15, 1972.

2,789,460, R. Kaufman, FOLDING STEREOSCOPIC VIEWER, **filed** June 19, 1972, D.C., S.D. Ind. (Indianapolis), Doc. IP 72–C–297, *The Taylor-Merchant Corporation* v. *Quinlan Keene Peck & McShay, Inc., also known as Graphic Productions.*

2,801,941, S. C. Johnson, METHOD OF CLEANING RAILWAY CARS AND THE LIKE, **filed** June 30, 1972, D.C., M.D. Fla. (Jacksonville), Doc. 72–478–C–J–M, *Chemed Corporation* v. *Jacksonville Robo, Inc.*

2,817,737, W. W. Morris, ELECTRICAL RESISTANCE NETS, **filed** Nov. 15, 1970, D.C.N.J. (Newark), Doc. 1534–70, *Neoweld Corporation and Connecticut Dev. Credit Corp.* v. *Cooperheat and Peter J. Cooper.* Consent judgment declaring patent valid and infringed, May 24, 1972.

2,930,023, H. W. Earl, ELECTRICAL CONNECTOR, **filed** July 19, 1972, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 72–595, *Earl Connectors, Inc.* v. *Hunter Sales Corporation.*

2,934,932, H. B. Wagner, HYDRAULIC CEMENT MORTAR COMPOSITIONS AND METHODS OF USE; **2,990,282,** Wagner and Fitzgerald, COMPOSITION COMPRISING HYDRAULIC CEMENT, METHYL CELLULOSE AND REEMULSIFIABLE POLYVINYL ACETATE, METHOD OF PREPARING SAME AND MORTAR PREPARED THEREFROM, **filed** Nov. 4, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71–2125, *Title Council of America, Inc.* v. *Garland White & Company, Inc.* Consent judgment in favor of the plaintiff, May 23, 1972.

2,958,872, F. J. Meyer, SWIMMING POOL COVER, **filed** Nov. 6, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70C1386, *Fred J. Meyer, Jr.* v. *Roslyn Cover Co.* Consent judgment, June 21, 1972.

2,979,119, H. Kramer, WEB-TO-TUBE FASTENINGS; **3,042,113,** same; **3,092,177,** same, **filed** Sept. 18, 1967, D.C., S.D.N.Y., Doc. 67–C–3600, *Hyman Kramer, doing business as Hy Kramer Enterprises* v. *G. & A. Machine Works, Inc. et ano.* Stipulation and order of dismissal, without prejudice, May 15, 1972.

2,990,382. (See 2,934,932.)

3,042,113. (See 2,979,119.)

3,062,108, C. R. May, ELECTROPHOTOGRAPHIC COPYING APPARATUS; **3,121,006,** Middleton and Reynolds, PHOTO-ACTIVE MEMBER FOR XEROGRAPH; **3,324,291,** F. W. Hudson, CORONA GENERATING DEVICE WITH MEANS TO CAUSE AIR FLOW THERETHROUGH TO MAINTAIN THE PARTS FREE OF DUST ACCUMULATION, **filed** Apr. 28, 1972, D.C., S.D.N.Y., Doc. 72–C–1758, *Xerox Corporation* v. *Litton Industries, Inc.*

3,001,912, Stoddard and Seem, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Jan. 21, 1971, D.C., S.D. Fla. (Miami), Doc. 71–85–C–JLK, *Lex Tex Ltd., Inc.* v. *Aileen, Inc.* (*Aileen Sportswear*). Motion to dismiss, granted without prejudice to the plaintiff to bring action in a district where proper venue lies, May 10, 1971.

3,092,177. (See 2,979,119.)

3,093,545, Westfall and Lewis, THERAPEUTIC IRON-DEXTRAN PREPARATIONS, **filed** Apr. 3, 1972, D.C., W.D. Mo. (Kansas City), Doc. 20238–3, *Armour Pharmaceutical Company* v. *Med-Tech, Inc.* Final judgment and permanent injunction filed July 11, 1972. (Upon consent plaintiff is owner of patent, defendant enjoined.)

3,110,905, T. M. Rhodes, TUFTED PILE FABRIC COMPRISING A FLAT WOVEN SYNTHETIC PLASTIC BACKING; **3,336,178,** R. G. Levitch, DOUBLE BACKED PILE CARPET; **3,359,934,** Schwartz and Port, TUFTED CARPET HAVING SPLITTABLE FILLING YARNS IN THE PRIMARY BACKING, **filed** May 26, 1970, D.C. Del. (Wilmington), Doc. 3906, *Thiokol Chemical Corporation* v. *Burlington Industries, Inc. and Avisun Corporation.* Dismissed by stipulation of counsel, June 29, 1972.

3,121,006. (See 3,062,108.)

3,122,907, E. Gilberton, GAS LIGHTER OF THE SUSPENDED CONTAINER TYPE, **filed** May 16, 1968, D.C., S.D.N.Y., Doc. 68–C–2007, *Etablissements Genoud & Cie.* v. *Medico Pipes, Inc.* Order that action is discontinued, July 10, 1972.

3,147,906, H. I. Roccaforte, PLATFORM CARTON, **filed** June 14, 1971, D.C., E.D. Mich. (Detroit), Doc. 36652, *Riegel Paper Corp.* v. *Ex-Cello Corp.* Consent judgment for permanent injunction, May 5, 1972.

3,152,381, Priester and McWhorter, METHOD FOR PRODUCING FABRIC, **filed** July 11, 1972, D.C. Mass. (Boston), Doc. CA 72–2137–J, *Collins & Aikman Corporation* v. *Malden Mills, Inc.*

3,158,424, J. W. Maston, RETENTION SYSTEM FOR ELECTRICAL CONTACTS; **3,165,369,** R. Bowen, CONTACT MOUNTING, filed Mar. 14, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c653, *Bunker-Ramo Corporation* v. *International Telephone & Telegraph Corporation.* Voluntary dismissal pursuant to Rule 41(a)(1)(i), May 31, 1972.

3,165,369. (See 3,158,424.)

3,190,405, R. K. Squire, EXTENDABLE SHORE, filed Feb. 11, 1971, D.C., N.D. Ohio (Toledo), Doc. C71–45, *Bliss & Laughlin Industries, Inc.* v. *Bil-Jax, Inc.* Defendant permanently enjoined, counterclaim dismissed, June 27, 1972.

3,192,856, T. W. Gavin, REPETITIVE CYCLE ROTARY IMPRESSION MACHINE, filed June 7, 1968, D.C., S.D.N.Y., Doc. 68–C–2340, *Thomas W. Gavin* v. *Geveke & Co. International, Inc.* Order of dismissal for lack of prosecution, Gurfein, *J.*, June 26, 1972.

3,201,784, Hendricks and Platt, DISPLAY APPARATUS, filed Jan. 17, 1966, D.C., S.D. Calif. (Los Angeles), Doc. 66–75–CC, *Industrial Electronics Engineers, Inc.* v. *Shelly Associates, Inc.* Filed stipulation of dismissal with prejudice, May 1, 1972.

3,219,276, E. O. Norris, PLURAL NOZZLES HAVING INTERSECTING SPRAY AND CONTROL THEREFOR; **3,301,488,** same, SPRAY GUN, filed June 6, 1972, D.C. Conn. (New Haven), Doc. 15087, *Champion Spark Plug Co.* v. *The Gyromat Corporation.*

3,266,173, G. H. Sheridan, TRAINING APPARATUS, filed Sept. 24, 1971, D.C. Del. (Wilmington), Doc. 4231, *The Aetna Casualty and Surety Company* v. *Singer-General Precision, Inc.* Stipulation of settlement, June 21, 1972.

3,301,488. (See 3,219,276.)

3,324,291. (See 3,062,108.)

3,336,178. (See 3,110,905.)

3,359,934. (See 3,110,905.)

3,377,184, M. Kukoff, DECORATIVE FABRIC, filed Nov. 1, 1968, D.C., S.D.N.Y., Doc. 68–C–4339, *Milton Kukoff* v. *Dove Creations, Inc.* Order of discontinuance without prejudice, June 29, 1972.

3,407,617, Wischmeyer and Hoffman, METHOD OF REMOVING DISSOLVED WAX FROM A REFRIGERANT, filed Oct. 4, 1971, D.C., E.D. Mo. (St. Louis), Doc. 71C612(4), *Emerson Electric Co.* v. *Sporlan Valve Company.* Stipulation for dismissal without prejudice, June 13, 1972.

3,413,459, R. Sonneman, COUNTERPOISE LAMP, filed Dec. 12, 1968, D.C., S.D.N.Y., Doc. 68–C–4967, *Robert Sonneman Associates, Inc.* v. *Neil Tannenbaum et al.* Stipulation and order of dismissal pursuant to Rule 41a(1)-So, June 28, 1972.

3,421,731, Koch and Rocher, HOT TOP MAINTAINING SYSTEM, filed Apr. 29, 1970, D.C., N.D. Ohio (Cleveland), Doc. C–70–391, *Metallurgical Exoproducts Corporation* v. *Insul Company, Inc.* Consent judgment, June 27, 1972.

3,568,853, H. J. Feibelman, ARTICLE HOLDER FOR USE IN DISPLAY RACK, filed Nov. 10, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71C1456, *A & H. Mfg. Co.* v. *Novel Box Co., Inc.* Discontinued, June 14, 1972.

Certificates of Correction for the Week of Nov. 28, 1972

Re. 27,290	3,623,553	3,642,816	3,660,428
D. 223,464	3,624,062	3,643,032	3,660,513
3,298,571	3,625,049	3,643,057	3,660,540
3,448,972	3,625,974	3,643,583	3,660,986
3,464,978	3,626,300	3,644,188	3,661,284
3,507,437	3,627,717	3,644,585	3,661,846
3,519,561	3,627,735	3,645,514	3,661,865
3,551,705	3,627,821	3,645,655	3,661,898
3,560,972	3,628,921	3,647,121	3,661,957
3,563,963	3,629,692	3,647,413	3,662,318
3,566,402	3,630,240	3,647,569	3,663,484
3,567,776	3,630,244	3,648,796	3,663,664
3,571,852	3,630,980	3,649,014	3,664,456
3,577,100	3,631,012	3,652,003	3,664,458
3,582,300	3,631,591	3,652,930	3,664,745
3,586,904	3,631,722	3,653,445	3,664,778
3,589,916	3,631,802	3,654,340	3,665,180
3,592,022	3,633,713	3,654,417	3,666,714
3,592,826	3,634,039	3,655,391	3,666,776
3,595,614	3,634,374	3,655,444	3,666,817
3,598,338	3,634,612	3,655,534	3,667,004
3,600,416	3,634,669	3,655,768	3,667,716
3,604,821	3,634,995	3,655,829	3,669,065
3,604,982	3,636,264	3,655,921	3,669,613
3,605,761	3,636,956	3,656,005	3,669,622
3,608,068	3,637,145	3,656,454	3,669,911
3,609,005	3,638,025	3,657,189	3,670,176
3,609,109	3,638,178	3,657,508	3,670,308
3,613,201	3,639,465	3,657,957	3,670,858
3,613,571	3,639,538	3,658,838	3,671,382
3,616,129	3,640,351	3,658,839	3,671,550
3,616,191	3,641,202	3,658,852	3,672,579
3,616,375	3,641,439	3,658,862	3,672,918
3,617,483	3,641,718	3,659,473	3,675,248
3,622,367	3,641,853	3,659,476	3,676,149
3,622,432	3,642,026	3,659,916	3,676,345
3,622,548	3,642,440	3,660,391	3,676,517
3,622,797	3,642,632	3,660,421	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 14, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-05-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching, Dyeing and Photography.	8-31-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-22-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-18-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-13-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-21-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-18-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	4-07-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-30-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	9-01-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-27-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-13-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-15-71

Expiration of patents: The patents within the range of numbers indicated below expire during December 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,725,558 to 2,728,912, inclusive
Plant Patents..... Numbers 1,436 to 1,441, inclusive

REISSUES

NOVEMBER 28, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,522

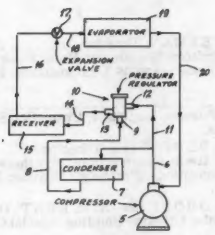
SYSTEM FOR MAINTAINING PRESSURE IN REFRIGERATION SYSTEMS

John A. Schenk and Ralph B. Tilney, St. Louis, Mo., assignors to Emerson Electric Co.

Original No. 2,986,899, dated June 6, 1961, Ser. No. 704,665, Dec. 23, 1957. Application for reissue Nov. 12, 1969, Ser. No. 871,499

Int. Cl. F25b *41/00*

U.S. Cl. 62—196 5 Claims



A refrigeration system with a bypass around the condenser, and a three-way valve to control refrigerant flow to (or from) the condenser and through the bypass, comprising a unitary pressure regulated valve member operable between opposite valve ports, and moved in response to pressure upstream of the expansion device to throttle flow through the condenser when that pressure is too low and at the same time to enlarge flow through the bypass. When the pressure is higher, the valve modulates to reduce flow through the bypass and increase flow through the condenser.

27,523

MACHINE FOR AUTOMATICALLY PLACING BAGS ON A WICKET

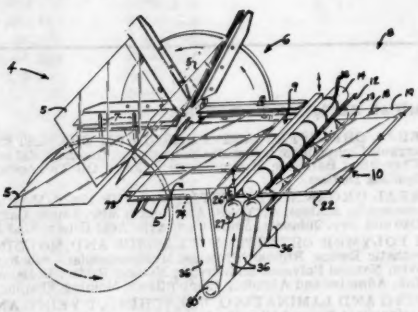
Lawrence Maccherone, Emerson, N.J., assignor to FMC Corporation, San Jose, Calif.

Original No. 3,462,026, dated Aug. 19, 1969, Ser. No. 633,126, Apr. 24, 1967. Application for reissue Mar. 20, 1970, Ser. No. 21,557

Int. Cl. B65g *57/03, 57/08*

U.S. Cl. 214—8 15 Claims

Machine for automatically placing bags with mounting holes on a wicket is adapted for use at the output of a high-speed bag production line. The machine comprises a revolving carriage having clamping means adapted to grasp the bag and to revolve the bag over to a position adjacent to the wicket with the mounting holes exposed and positioned to engage the legs of the wicket. A conveyor adjacent to the revolving carriage brings the bags from the output of the production line to the carriage. As the carriage revolves, actuating means close the clamping mechanism near the conveyor for grasping the bag near the mounting holes with these holes exposed, and as the carriage continues to revolve the actuating means releases the clamping means after the bags have been individually engaged on the wicket. The revolving movement serves advantageously to cool the regions of the bag which were heat sealed to form the bag in the production line.



27,524

ENZYMATIC DETERMINATION OF NITROGEN-CONTAINING COMPOUNDS AND ENZYMES REACTIVE THEREWITH

Richard G. Nadeau, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original No. 3,485,723, dated Dec. 23, 1969, Ser. No. 502,596, Oct. 22, 1965. Application for reissue Jan. 4, 1971, Ser. No. 103,931

Int. Cl. C12d *13/00*

U.S. Cl. 195—103.5 20 Claims

A process for measuring the amount of a nitrogen-containing compound in a sample or the amount of an enzyme in a sample, the enzyme being reactive with a nitrogen-containing compound, which involves (1) mixing the sample with a compound that is enzymatically reactive with ammonia; (2) adding to the nitrogen-containing compound in the sample an amount of the enzyme or adding to the enzyme a non-rate limiting amount of a nitrogen-containing compound to release ammonia, in either case, at a measurable rate; and (3) measuring the rate of reaction of ammonia with the compound that is reactive with ammonia, this rate of reaction being proportional to the concentration of the nitrogen-containing compound or the concentration of the enzyme, as the case may be, in the original sample.

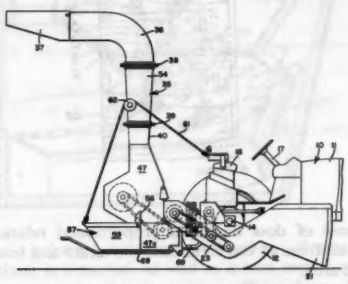
27,525
COTTON HARVESTER

Leon Franklin Sanderson, Des Moines, Iowa, Myron L. McCunn, Horicon, Wis., and Richard Wayne Hook, Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Original No. 3,397,522, dated Aug. 20, 1968, Ser. No. 469,484, July 6, 1965. Application for reissue Feb. 3, 1970, Ser. No. 10,668

Int. Cl. A01d *45/20*

U.S. Cl. 56—30 25 Claims



A material conveying and separating structure for use on a cotton harvester that includes a chamber that receives a mixture of ripe and green bolls from a cotton harvester, a blower duct extending vertically from the chamber and with a blower directing air through the duct, and a communication duct that extends between the chamber and blower duct that operates to induce or draw the ripe bolls from the chamber.

27,526
METHOD AND DEVICE FOR DETERMINING THE CONVEY CONCENTRATION OF DREDGING SPOIL OF A SUSPENSION OF DREDGING SPOIL AND WATER

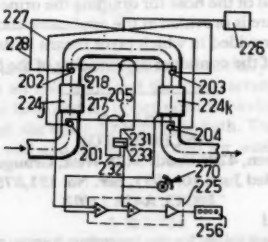
Romke van der Veen, Jutphaas, Netherlands, assignor to N.V. Ingenieursbureau Voor Systemen en Octrooien "Spanstaal," Rotterdam, Netherlands

Original No. 3,554,011, dated Jan. 12, 1971, Ser. No. 817,999, Apr. 21, 1969. Application for reissue July 19, 1971, Ser. No. 164,155

Claims priority, application Netherlands, Apr. 24, 1968, 6805779

Int. Cl. G01n *9/26, 15/06*

U.S. Cl. 73—61 R 8 Claims



A system for measuring the concentration of a dredging spoil suspension wherein the suspension is caused to flow vertically upwards and vertically downwards in two pipe sections. Upper and lower conduits are coupled between corresponding upper and lower points on the two vertical pipe sections, and a pressure pickup is obtained between the midpoints of the upper and lower conduit.

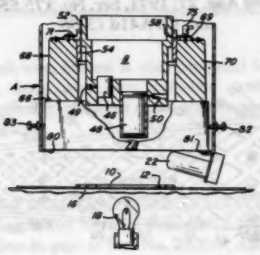
27,527
PHOTOGRAPHIC PRINTING APPARATUS FOR MAKING PLURAL ASSORTED-SIZED PRINTS SIMULTANEOUSLY

Arthur J. Daugherty, Kansas City, Mo., assignor to Film Corporation of America, Philadelphia, Pa.

Original No. 3,401,594, dated Sept. 17, 1968, Ser. No. 510,852, Dec. 1, 1965. Application for reissue Dec. 8, 1969, Ser. No. 888,184

Int. Cl. G03b *27/44*

U.S. Cl. 355—46 8 Claims



Interchangeable lens cells for photographic printing apparatus to project plural assorted-sized prints simultaneously from single frames of various film sizes. Each cell includes a plurality of a first set of object lenses of a particular focal length mounted in a first plane and at least one objective lens of a second focal length mounted in a second plane parallel to and displaced from the first plane.

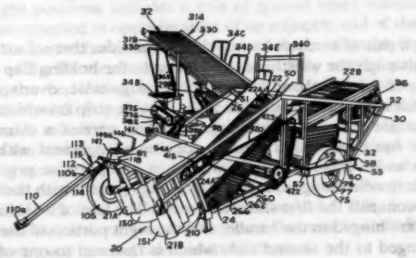
27,528
METHOD OF AND APPARATUS FOR HARVESTING VINE CROPS

Olin L. Looker, Stockland, and Edwin F. Greedy, Hoopeston, Ill., assignors to FMC Corporation, San Jose, Calif.

Original No. 3,301,331, dated Jan. 31, 1967, Ser. No. 415,633, Dec. 3, 1964, which is a continuation of Ser. No. 127,199, July 27, 1961. Application for reissue Dec. 2, 1970, Ser. No. 94,636

Int. Cl. A01d *17/04*

U.S. Cl. 171—1 26 Claims



[1. A method of harvesting a vine crop which includes vines growing in a row and fruit both loose on the ground around the vines and fruit attached to the vines comprising the steps of; severing vines underground and scooping up dirt, severed vines and their attached friut, as well as loose fruit lying on the ground, whereby severed vines, attached fruit and loose fruit constitute a mass of scooped-up material, conveying said mass through a separating stage where loose fruit and dirt are separated from said mass, and shaking said vines subsequently to said separating stage thereby separating said attached fruit from the vines, said loose fruit being separated from said mass before said shaking step so as not to subject said loose fruit to said shaking step.]

PATENTS

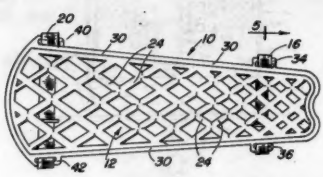
GRANTED NOVEMBER 28, 1972

GENERAL AND MECHANICAL

3,703,728
ARM GUARD FOR ARCHER

Thomas Allen Saunders, and Eugene F. Saunders, both of Columbus, Nebr., assignors to Saunders Archery Co., Columbus, Nebr.

Filed Aug. 27, 1971, Ser. No. 175,554
Int. Cl. A41d *13/08*
U.S. Cl. 2—16 **5 Claims**



A light-weight lattice-like shield including integrally formed loops for receiving adjustable, flexible and elastically extensible bands for securement of the shield to the forearm of an archer, thereby to serve as a protective arm guard

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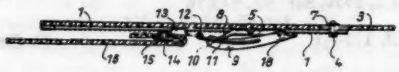
3,703,729
TROUSERS WITH ADJUSTABLE WAIST

Rolf Hinderer, Nagold, Germany, assignor to Rolf Hinderer Gmb, Nagold, Germany

Filed July 12, 1971, Ser. No. 161,654
Claims priority, application Germany, Sept. 26, 1970, G 70 35 712.9; March 25, 1971, P 21 14 407.0
Int. Cl. A41d *1/06*
U.S. Cl. 2—237 **9 Claims**



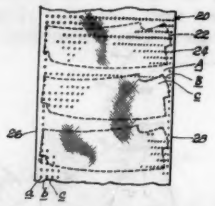
In a pair of trousers having slits in the sides thereof extending through the waistband, and closures for holding flap portions of the waistband at each slit in adjustable, overlapping relationship, each closure includes a guide strip on which two slides are movable guided. A first slide carries a clamping lever equipped with a cam for locking engagement with the strip and a pivoted handle which, in its operative position, holds the clamping lever in locking engagement with the strip and conceals the first slide from view. The legs of a U-shaped link are hinged to the handle, and the bight portion of the link is hinged to the second slide which is fastened to one of the two flap portions, the strip being fastened to the other flap portion.

3,703,730
INTERLINING

Samuel E. Miller, Winnetka, Ill., assignor to Quick Service Textiles, Inc., Chicago, Ill.

Filed Sept. 27, 1971, Ser. No. 183,972
Int. Cl. A41d *27/02*
U.S. Cl. 2—272 **7 Claims**

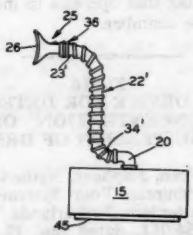
Textile interlinings having a stiffening function of the type comprising a fabric sub-strate carrying a myriad of closely spaced dots, usually of a fusible substance, e.g. a thermoplastic resin, whereby the interlining may be reliably secured to an adjacent fabric layer by application of heat and/or pressure. The invention relates to an improved arrangement of dots having a proportioned relation to the desired stiffness of the laminated sub-strate and interlining in selected area.



3,703,731
PORTABLE URINAL

Florence E. Leiser, 1 Marshall Street, Irvington, N.J.

Filed Jan. 11, 1971, Ser. No. 105,224
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 **2 Claims**



A portable urinal consists of a container having an inlet means near its top, and an extendable and retractable hose with one end attached to the inlet. A funnel-type application, designed to be held in the hand and having a forward portion shaped to fit the body against which it is applied, is connected to the other end of the hose for draining the urine into the container. A closure is provided at the applicator end. Also, a carrying case is provided in which pivot means in its bottom permits rotation of the container and winding of the hose therein.

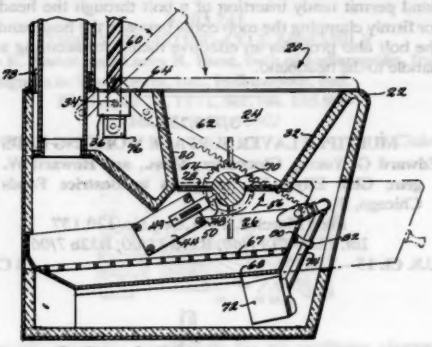
3,703,732
INCINERATOR

Clifford L. Green, 4296 South 3425 West, Granger, Utah

Filed June 10, 1971, Ser. No. 151,875
Int. Cl. A41k *11/02*
U.S. Cl. 4—131 **4 Claims**

A combustion toilet for incinerating human waste with a lower incinerating chamber and an upper chamber which receives the waste and is closed by a lid. The waste falls on a butterfly valve which is mounted between the two chambers and is mechanically linked to the lid so as to deposit the waste into the lower chamber when the lid is closed. A mercury switch is mounted for rotation with the valve so as to be electrically closed when the lid is closed and is electrically con-

nected to a manually actuable timer and gas valve so that the gas valve admits gas, such as propane, butane or natural gas, into the lower chamber to incinerate the waste only while the mercury switch is closed and the timer remains actuated.



Preferably, a solenoid is provided to prevent closing the lid until the timer is actuated, as well as a heat sensor mounted outside the lower chamber for cutting off gas flow whenever the sensed temperature exceeds predetermined limits.

3,703,733

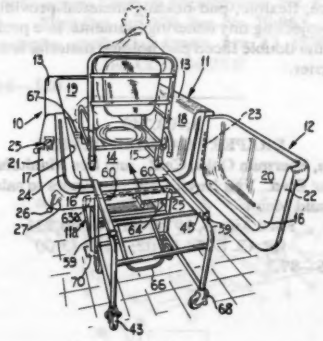
BATH ARRANGEMENTS

George McLoughlin, Lee Cottage, Thrum Hill Lane, Rochdale, England

Filed Dec. 21, 1970, Ser. No. 99,875

Int. Cl. A47k *3/12*

U.S. Cl. 4—185 L **10 Claims**



In a bath and chair arrangement especially for the infirm, the bath has an end door and the chair arrangement can be locked to the bath and an upper portion having a seat can be rolled through the open door into the bath. The lower portion is then removed and the door closed for washing of the patient.

3,703,734

ELEVATED AND CONFINED FLOOR AREA APPARATUS FOR THE CARE OF INVALIDS AND SMALL CHILDREN

Lottie Mae Carr, P. O. Box 41362, Miami, Fla.

Filed March 26, 1971, Ser. No. 128,261

Int. Cl. A47s *9/00*; A47c *27/08*

U.S. Cl. 5—99 R **5 Claims**

A modulate elevated floor apparatus for erection is any size room with a peripheral walkway for the purpose of attending infants, small children or invalids without ending over to room floor level, is described. A peripheral guard fence and rail confines children or invalids being cared for to the elevated floor area. Trap door means is provided in the elevated flooring to permit an attendant access to a central zone of the elevated flooring to attend to matters that cannor be reached from the

peripheral walkway. Means is also provided for sub-dividing the elevated floor area into crib-like compartments for separately confining infants or small children whenever necessary or desirable.

3,703,735

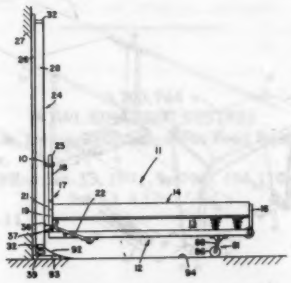
RETRACTING BED MECHANISM

Stephen G. Moore, 461 Nevada, Palo Alto, Calif.

Continuation-in-part of Ser. No. 29,899, April 20, 1970, abandoned. This application Sept. 2, 1970, Ser. No. 68,846

Int. Cl. A47c *19/06*

U.S. Cl. 5—147 **7 Claims**



Mechanism for shifting a bed between horizontal and upright positions includes a pair of spaced apart vertical lift means coupled to opposite sides of an adjacent end of the bed and means for fastening the mattress to the headboard. Operation of the lift means draws the bed to a fully vertical position with the bed being between the lift means and being flat against a wall. Support structure for the remote end of the bed includes rollers on pivoting legs which swing into alignment with the bed as the vertical position is approached and which swing outward as the bed is lowered. Continued lowering of the bed causes the legs to pivot past a perpendicular position whereby the legs are inclined when the bed is fully lowered and contact a stop to securely support the remote end without requiring any manual manipulations thereat.

3,703,736

ANCHORING DEVICE FOR BUOYANT LIFE SAVING EQUIPMENT

William York Higgs, Gibsons, British Columbia, Canada, assignor to Star Lifeline Limited, North Vancouver, British Columbia, Canada

Filed June 18, 1970, Ser. No. 47,312

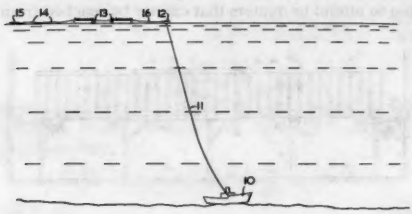
Claims priority, application Canada, Oct. 16, 1969, 65,037

Int. Cl. B63b *21/52*

U.S. Cl. 9—9 **11 Claims**

This invention is concerned with life saving equipment. The instant characteristics of many vessels has led to loss of life. In accordance with the invention a buoy is provided with mooring means for securing buoyant life saving equipment to the

buoy. The buoy is mounted on a vessel and is secured to it by a securing line which is wound on a cable drum permitting the



line to pay out and the buoy to surface when the vessel sinks. The vessel provides an anchor for the buoy and hence the life saving equipment to prevent its dispersal.

3,703,737

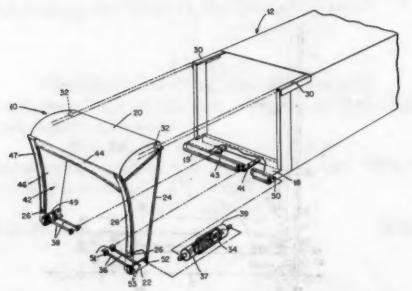
CANOPY APPARATUS

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to Boothe Airside Services, Inc.

Filed May 24, 1971, Ser. No. 146,337

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **6 Claims**



A canopy for closing a gap between a gangway with a walkway and an aircraft includes a top and two side portions adapted to be movably mounted to the gangway. The forward portions of the canopy are flexible to conform to the shape of the aircraft after the walkway comes into physical engagement with the aircraft.

3,703,738

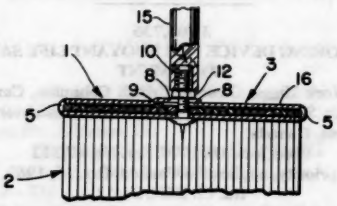
MOP WITH METAL HEADBAND

Theron V. Moss, 3175 Falmouth Road, Shaker Heights, Ohio, and Theron C. Moss, P.O. Box 234, Cleveland, Tenn.

Filed March 16, 1971, Ser. No. 124,884

Int. Cl. A47l *13/24, 13/502*

U.S. Cl. 15—229 A **9 Claims**



A mop with metal headband formed from a single strip of metal bent to shape around the mop cords intermediate the ends thereof. One end of the metal strip is outwardly offset relative to the other end to permit overlapping of the ends on one side of the headband while still maintaining tight engagement between the headband and mop cords across the entire width of the headband. Aligned slots in the overlapping ends of the metal strip and aperture in the other side of the headband permit ready insertion of a bolt through the headband for firmly clamping the mop cords between the headband, and the bolt also provides an effective means for securing a mop handle to the headband.

3,703,739

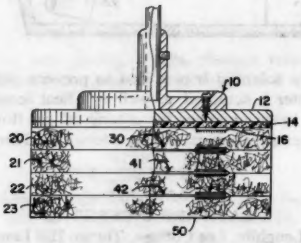
MULTIPLE LAYER SURFACE WORKING PADS

Edward G. Young, Gloucester, Mass., and Howard W. Heggem, Glen Ellyn, Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed March 2, 1971, Ser. No. 120,137

Int. Cl. A47l *11/40;* **B24d** *11/00;* **B32b** *7/06*

U.S. Cl. 15—230.17 **4 Claims**



Surface working pads formed of open non-woven three-dimensional web material, as typified by the so-called nylon floor pads, are releasably retained on a driving disc or brush block in a stack in which adjacent pads are held together by double face, flexible, pad holding material providing a multitude of projecting tiny adhering filaments. In a preferred embodiment the double faced pad holding material is attached to a sheet carrier.

3,703,740

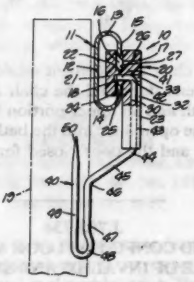
DRAPERY CARRIER DEVICE

Sam Mann, Sherman Oaks, Calif., and Ben Mankofsky, 13753 Chandler Blvd., Van Nuys, Calif., assignors to said Mankofsky, by said Mann

Filed Aug. 3, 1970, Ser. No. 60,231

Int. Cl. E05d *13/02;* **A47h** *13/00*

U.S. Cl. 16—87.2 **9 Claims**



A drapery carrier device for vertically supporting draperies and the like from a traverse rod includes a body member and a hook member. The body member includes a retainer portion which is integrally connected to the upper end of a pendant portion by a shank. The body member is adapted to be slidably

mounted on the traverse rod with the retainer portion extending into an elongated slot in the rod and the hook member which is adapted to engage and vertically carry the hem portion of the draperies is rigidly secured to the pendant portion.

3,703,741

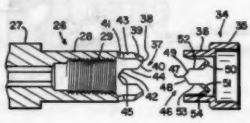
TORQUE RESISTING AXLE ASSEMBLY

John R. Foster, and Larry R. Hunt, both of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed April 21, 1971, Ser. No. 135,909

Int. Cl. A47b *95/02*

U.S. Cl. 16—112 **7 Claims**



An axle assembly particularly for an oscillable element, consisting of a headed spool having a threaded bore opening through its unheaded end, a headed screw having a threaded shank receivable in the spool bore, and a shroud having a head portion enshrouding the screw head and a shank portion loosely sleeved on the screw shank between the screw head and its threads and having an outer diameter equal to that of the spool, the mating ends of the spool and shroud being formed for non-rotational interengagement so that the spool and the screw will be protected against relative rotary movement as a result of the operation of the oscillable element.

3,703,742

PLASTIC HINGE

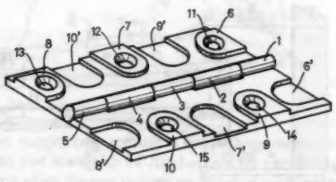
Mikio Konishi, Higashiyamaku, Japan, assignor to New Lite Industry Company Limited, Higashiyama, Ku, Kyoto, Japan

Filed Oct. 5, 1970, Ser. No. 78,063

Claims priority, application Japan, Apr. 13, 1970, 45/35656

Int. Cl. E05d *9/00*

U.S. Cl. 16—128 **6 Claims**



This invention relates to a plastic hinge provided with the holes for fixing on the right and left fixed plates at the places asymmetrical to each other respectively, whereby making it possible to firmly fix the hinge again by means of using the right and left fixed plates conversely to each other in case of strain being caused.

3,703,743

METHOD AND MEANS FOR RESTRAINING ANIMALS

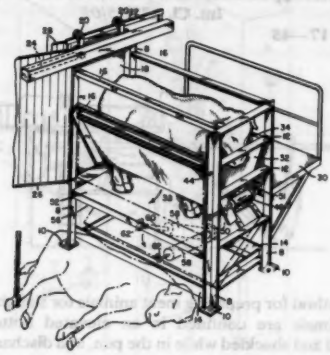
Carl Oscar Schmidt, Jr., Cincinnati, Ohio, assignor to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio

Filed Nov. 27, 1970, Ser. No. 93,160

Int. Cl. A22b *1/00*

U.S. Cl. 17—1 A **21 Claims**

A meat animal on foot enters the restrainer on a normally stationary horizontal floor hinged along one side edge. A retractable sloping side wall moves to support the belly; the floor drops to immobilize the animal for stunning then upon retraction of the side wall the animal slides down the now inclined floor in proper position for leg shackling and hoisting



to a bleeding conveyor. The device is also ideally suited for use by veterianians in handling animals.

3,703,744

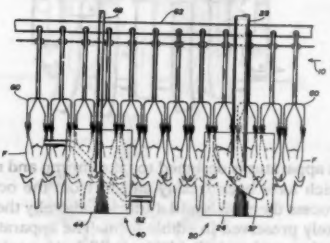
FOWL SINGEING SYSTEM

Janus J. Dillon, Irving, Tex., assignor to Food Equipment, Inc., Dallas, Tex.

Filed Jan. 13, 1971, Ser. No. 106,110

Int. Cl. A22c *21/04*

U.S. Cl. 17—11 **9 Claims**



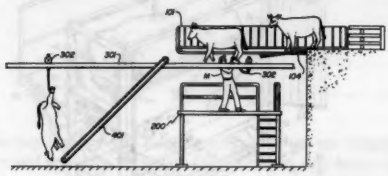
The specification discloses a fowl singeing system including first and second housings disposed in the path of fowl transported by a shackle system. A blast of ambient air is directed upon the fowl during passage through the first housing. A plurality of gas nozzles are supported on opposite sides of the second housing and are connected to a source of flammable gas in order to direct jets of flame therefrom upon ignition. A plurality of gas nozzles are spaced apart along a line slanted to the horizontal, wherein jets of flame cover substantially the entire body of each fowl transported through the second housing. The ends of the gas jet nozzles are laterally spaced at varying distances from the second housing in general correspondence with the shape of the fowls being transported therepast.

3,703,745

METHOD FOR PREPARING ANIMALS FOR SLAUGHTER

Everett Edwards, 1519 Deerwood Drive, South St. Paul, Minn.

Division of Ser. No. 764,773, Oct. 3, 1968, Pat. No. 3,599,276.
This application Jan. 15, 1971, Ser. No. 106,699
Int. Cl. A22b *5/02*
U.S. Cl. 17—45 **3 Claims**



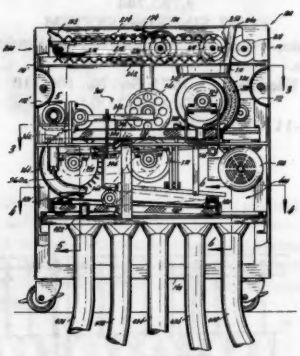
A method for preparing meat animals for slaughter in which the animals are confined in an elevated bottomless pen, stunned and shackled while in the pen, and discharged directly to a conveyor rail for slaughter.

3,703,746

APPARATUS FOR PROCESSING SHRIMP AND RELATED SHELLFISH

John M. Jones, Jr., 206 Grubb Street, Hertford, N.C.

Filed Feb. 26, 1971, Ser. No. 119,206
Int. Cl. A22c *29/00*
U.S. Cl. 17—71 **11 Claims**



This apparatus is designed to take shrimp and related shellfish which have been freshly caught from the ocean and seas and process them on board a trawler whereby they may be immediately preserved in edible form. The apparatus includes a means for setting individual shellfish to excise the heads thereof, sequentially orienting the deheaded shellfish for conveyance to and through a deveining step, and sequentially deshelling the shellfish and thereafter grading them for storage.

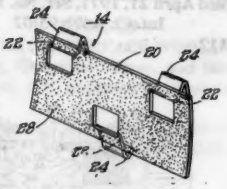
3,703,747

MOLDING CLIP

Denver C. Hamman, Evanston, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 9, 1970, Ser. No. 96,455
Int. Cl. A41b *19/00*
U.S. Cl. 24—73 HS **7 Claims**

The present invention relates generally to spring clips for securing molding strips and the like upon a supporting workpiece, and more particularly to molding clips which may be adhesively secured to said work surface. Molding clips disclosed in the drawings of this application includes a plate section having an outer surface conforming substantially with the contour of the work surface to which the clip is to be attached. Laterally yieldable fingers are formed integral with and extend from said plate section, the free extremities of said fingers providing oppositely disposed shoulders for accommodating



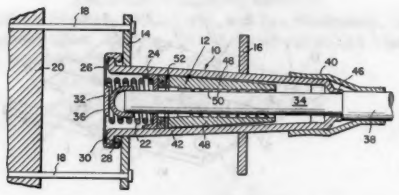
complementary oppositely disposed flanges of a molding strip. The area of integral connection of each finger with plate section is spaced laterally of the margin of the plate section adjacent the shoulder of the finger. Adhesive means associated with the mounting surfaces of the plate section is employed to secure the clip device to a supporting work surface.

3,703,748

ANCHOR FOR POST-TENSIONING PRESTRESSED CONCRETE

William F. Kelly, New Orleans, La., assignor to Kelly Systems, Inc., New Orleans, La.

Filed Aug. 14, 1970, Ser. No. 63,805The portion of the term of this patent subsequent to Aug. 18, 1988, has been disclaimed.
Int. Cl. F16g *11/00*
U.S. Cl. 24—126 **9 Claims**



This invention is an anchor for post-tensioning prestressed concrete including a case having a central bore through which a tendon passes, the internal wall of the case defining the central bore being tapered in a manner to form a compound angle with respect to the longitudinal axis of the case. A chuck comprising chuck segments is positioned within, and movable longitudinally with respect to, the case, the inner faces of the chuck segments being provided with a series of teeth engageable with the outer surface of the tendon which passes through the case and chuck. The compound angles of the case offers relief to the forward portion of the chuck segments in order to better distribute the forces exerted by the chuck segments on the tendon over the length thereof. Variations in the compound angles arid/or the chuck segments permit use of the anchor for either locking engagement with a tendon or nonlocking engagement therewith when anchor releasing is desired.

3,703,749

CENTRAL STRAP LOCK, ESPECIALLY FOR BODY HARNESS EQUIPMENT FOR PARACHUTE JUMPERS

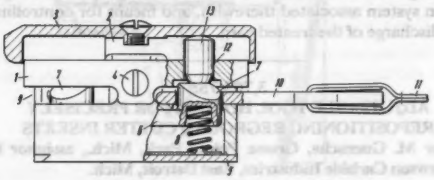
Peter Pfabe, Hamburg, Germany, assignor to Autoflug GmbH, Egenbuttel, Germany

Filed Sept. 1, 1971, Ser. No. 177,041

Claims priority, application Germany, Sept. 3, 1970, P 20 43 634.4

Int. Cl. A47b *19/00*

U.S. Cl. 24—205.17 9 Claims



A central strap lock, especially for parachutists, in which the parachute straps converging to a central area of the lock can all but one quickly be released from the lock by depressing an actuating member, e.g. in the form of a rotatable disc, which can register with at least two circular positions, while a holding member in axial alignment with one of the anchor bolts for receiving the ends of the straps retains contact with said one anchor bolt to positively prevent separation of the respective strap from the said one anchor bolt when the anchor bolt support is depressed.

3,703,750

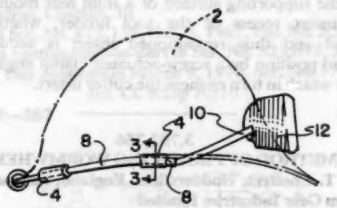
MEANS FOR ATTACHING GOGGLES TO HELMETS

Charles B. Irwin, Jr., 9119 Northfield Road, Ellicott City, Md.

Filed Aug. 11, 1971, Ser. No. 170,763

Int. Cl. A61f *9/06*

U.S. Cl. 24—265 R 3 Claims



The goggle supporting means is an arrangement to attach the goggles to the lower lip of the helmet by providing a plurality of spring clips having means associated with each of the clips for supporting a flexible tube through which an elastic band attached to the goggles may freely move.

3,703,751

YARN TREATING JET

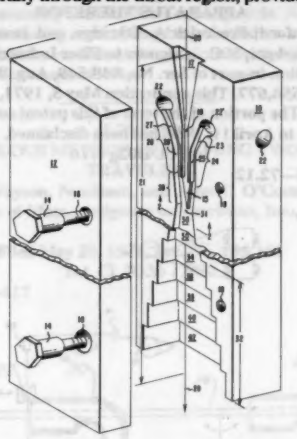
William W. Bowen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 27, 1971, Ser. No. 166,469

Int. Cl. D02g *1/16*

U.S. Cl. 28—1.4 1 Claim

A yarn treating jet comprising a body member and a cover clamped together. There is a longitudinal passage recessed in the surface of the body that is contiguous with the cover with two opposed fluid conduits in communication with the passage for supplying treating fluid to yarn passing through the passage. The passage includes successively, a tapered length, a straight length of one depth and a converging throat region of a greater depth. The opposed fluid conduits enter the throat region at the parallel to the longitudinal axis of the passage. This passage arrangement along with a raised tapered land extending centrally through the throat region, provides a smooth



acceleration of the fluid as it meets the threadline to avoid undue buffeting of the threadline in the jet passage and formation of neps.

3,703,752

APPARATUS FOR MAKING A PATTERN ON A FIBROUS WEB

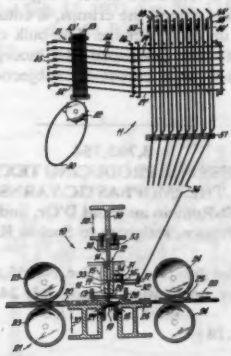
Alfons Schulte, Bocholt/Westfalen, Germany, assignor to Firma Johann Borgers KG, Bocholt/Westfalen, Germany

Filed Oct. 26, 1970, Ser. No. 84,062

Claims priority, application Germany, Oct. 24, 1969, P 19 53 494.2

Int. Cl. D04h *18/00*

U.S. Cl. 28—4 R 13 Claims



A web is transported on a table crossed by a needle holder bar in which a row of needles is mounted for movement between retracted and advanced positions. Selected needles of the row are locked in the advanced position by control means of the Jacquard machine type. When the table with the web is moved toward the needles, the selected locked needles penetrate the web, forming depressed portions in the same, while the non-selected freely movable needles are pushed back by the web to retracted positions. After each step of the web, a row of depressed and non-depressed portions is formed so that the depressed portions form a depressed pattern on the web.

If the web has two layers of different colors, fibers of the depressed portions of one layer are pushed through the other layer and form a colored pattern on the face of the same.

3,703,753

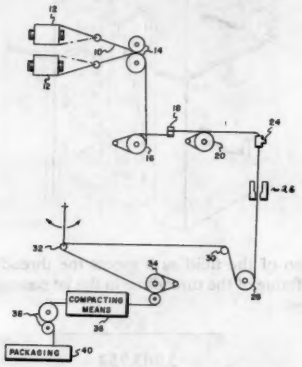
METHOD FOR PRODUCING A BULKED YARN AND APPARATUS THEREFOR

Jack C. Binford; Frederick A. Ethridge, and James R. Talbot, all of Charlotte, N.C., assignors to Fiber Industries, Inc.

Continuation-in-part of Ser. No. 848,549, Aug. 8, 1969, Pat. No. 3,654,677. This application May 5, 1971, Ser. No. 140,393. The portion of the term of this patent subsequent to April 11, 1989, has been disclaimed.

Int. Cl. D02g *1/16*

U.S. Cl. 28—72.12 14 Claims



A method for producing a yarn having latent bulking characteristics and the apparatus therefor is described. The yarn is composed of multifilament synthetic fibers which have been crimped and subjected to a constant tensioning process. The process involves subjecting a drawn yarn, preferably freshly drawn, to a crimping process which can be any of a number of crimping methods including stuffer box crimping, gear crimping, steam jet crimping and the like. The yarn emerges from the crimping step under a low, substantially uniform tension, is tensioned under a higher constant tension to at least partially extend the crimps, is entangled or twisted and then taken up on a package. The bulk characteristics of the yarn are preferably developed after incorporation into the end product such as a carpet by subjection to heat and moisture.

3,703,754

PROCESS FOR PRODUCING TEXTURED THERMOPLASTIC YARNS

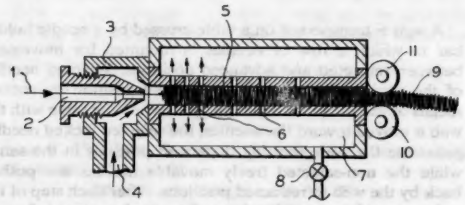
Charles Blanc, St-Romain au Mont D'Or, and Jean Joly, Brindas, both of France, assignors to Societe Rhodiaceta, Lyon, France

Filed July 21, 1970, Ser. No. 56,880

Claims priority, application France, July 24, 1969, 6925777

Int. Cl. D02g *1/12*

U.S. Cl. 28—72.14 4 Claims



An improved process for the production of springy, textured thermoplastic yarns wherein the yarns are compacted and compressed in an enclosed space by means of a flow of compressed fluid heated at a temperature that allows for the fixing of the yarn, a portion of the fluid affecting the movement of the yarn and another portion escaping to the side from the enclosed space, such process being characterized in that the escape of fluid is effected at a pressure which is lower than the feed pressure, but higher than atmospheric pressure.

The apparatus for effecting such process comprises a suction nozzle constituting a passage for the yarn and a delivery tube for admission of pressurized fluid, a tubular chamber communicating with the nozzle, and having orifices therein, a housing defining a closed space enclosing at least a portion of the length of the tubular chamber and having a pressure regulation system associated therewith, and means for controlling the discharge of the treated yarn.

3,703,755

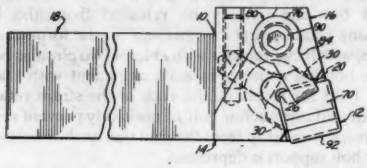
ADJUSTABLE TOOL HOLDER FOR PRECISELY REPOSITIONING REGROUND CUTTER INSERTS

Oscar M. Guensche, Grosse Pointe Park, Mich., assignor to Dawson Carbide Industries, East Detroit, Mich.

Filed Sept. 4, 1970, Ser. No. 69,551

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 3 Claims



This tool holder replaces the conventional cutter insert tool holder in the use of reground cutter inserts. It moves forward to the original and intended position the reground cutting edge of the hard cutter insert which has been reduced to a substandard size by such regrinding. In it, an insert locator in the form of a slide or plunger propelled by a fine adjustment screw engages the reground cutter insert and moves it precisely across the supporting surface of a shim seat mounted in the cutter insert recess of the tool holder, whereupon the reground and thus repositioned insert is secured in its relocated position by a screw-actuated clamp engaging a clip breaker which in turn engages the cutter insert.

3,703,756

METHOD OF PRODUCING WORMWHEELS

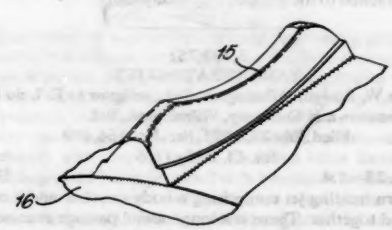
Walter T. Chesters, Huddersfield, England, assignor to David Brown Gear Industries Limited

Filed Jan. 20, 1970, Ser. No. 4,326

Claims priority, application Great Britain, Jan. 22, 1969, 3,659/69

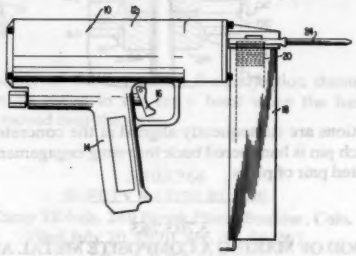
Int. Cl. B21d *53/28;* B23p *15/14;* B21h *5/00;* B29d *15/00;* B21k *1/30*

U.S. Cl. 29—159.2 4 Claims



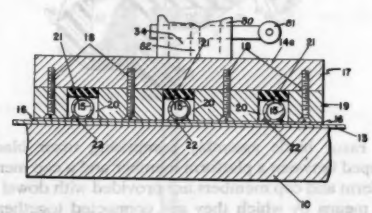
A wormwheel comprises a hub to which is welded or glued either a thin rim of another material in which are then formed conventional tooth gaps of a depth equal to or greater than the thickness of the rim, or individual helically disposed strips of another material which are subsequently formed into conventional teeth.

3,703,757
FASTENING DEVICE
James H. Backus, 3320 Franconia Road, Alexandria, Va.
Filed Dec. 8, 1970, Ser. No. 96,129
Int. Cl. B23p *19/00*; B23q *7/10*; B23p *11/00*
U.S. Cl. 29—200 P 3 Claims



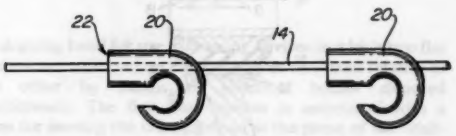
A fastener driving machine featuring conventional means for propelling the fasteners, for example, staples, in combination with a novel guiding system comprising a pair of arms provided with longitudinal grooves along which the fasteners travel and adjustable anvil means mounted for predetermined movement in relation to the arms and including curvilinear surfaces against which the fasteners strike causing the ends thereof to bend backward in securing relation, the fastener driving machine designed particularly for use in the construction of ferro-cement marine hulls wherein groupings or wires forming the framework thereof must be fastened together at preselected points.

3,703,758
APPARATUS FOR SECURING AN ELONGATED METAL MEMBER TO A FLAT METAL SHEET
Edward G. Beck, Jr., Fort Thomas, Ky., assignor to Airtex Corporation, Chicago, Ill.
Division of Ser. No. 673,138, Oct. 5, 1967, Pat. No. 3,514,834, which is a continuation-in-part of Ser. No. 523,619, Jan. 28, 1966. This application March 9, 1970, Ser. No. 17,566
Int. Cl. B23p *15/16*
U.S. Cl. 29—202 4 Claims



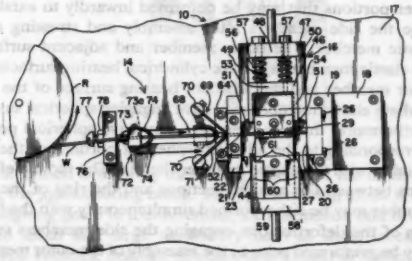
A method of securing metallic tubing and the like to a flat metal sheet while maintaining the flatness of the sheet so that the composite tube and sheet may be used as radiant heating or cooling panels in building interiors where distortion or wrinkling of the flat sheet would be undesirable. The apparatus comprises a heating station where a composite of sheet, of suitably disposed bonding material, and a piece of tubing in properly assembled relationship and under pressure are heated to induce a bond between the tubing and the sheet while maintaining the sheet in flat condition. An assembly station is provided including a jig in which the piece of tubing may be accurately located, means for accurately locating the jig with respect to the sheet, and means for raising and lowering the jig and for releasing the jig from the raising and lowering means so that it may move with the assembly from the assembly station to the heating station. After the heating cycle, the assembly moves to a cooling station (which may be the same as the assembly station) for a cooling cycle. A combined assembly and cooling station may be provided on each side of the heating station, each assembly station having a jig whereby production may be speeded up.

3,703,759
CONTINUOUS METHOD OF FORMING TWO-PART TRAVELERS
Andrew J. Wayson, Needham, and John T. O'Connelly, Medfield, both of Mass., assignors to Merriman, Inc., Hingham, Mass.
Filed May 20, 1971, Ser. No. 145,161
Int. Cl. B23p *17/00*
U.S. Cl. 29—417 8 Claims



A two-part traveler is fabricated continuously by molding discontinuous synthetic plastic running portions on a single wire. The wire is severed intermediate successive running portions and preferable adjacent to one running portion. The portion of the wire projecting from the opposite side is shaped by means of a wire forming machine to form the traveler in a continuous rapid manner.

3,703,760
MACHINE AND METHOD FOR CARD MOUNTING SHANKED BUTTONS
Edwin B. Pommer, Port Washington, N.Y., assignor to B. Blumenthal & Co., Inc., New York, N.Y.
Filed Feb. 12, 1971, Ser. No. 115,025
Int. Cl. B23p *19/04*
U.S. Cl. 29—433 22 Claims



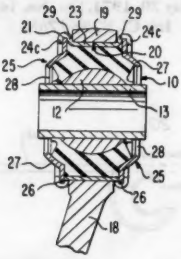
An apparatus for securing buttons having fastening eyes to a mounting card, the button eyes projecting through the card, which apparatus includes a jig having longitudinally spaced wells for receiving the eyes of buttons carried by the card positioned on the jig, and a narrower open-topped passageway traversing the jig across the wells and having tapered trailing ends. A feed mechanism advances a length of wire from a source thereof along the passageway and through the eyes, and shaping and severing members at opposite ends of the jig, which either reciprocate or oscillate, which sever the length of wire from the source and bend the ends thereof projecting beyond the end wells 180°. The card is then lifted, the fastening wire passing freely through the top of the passageway.

3,703,761

METHOD OF ASSEMBLING ELASTIC COUPLING

Frederick H. Van Winsen, Kircheim/Teck, and Hans-Karl Daur, Stuttgart-Bad Cannstatt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Division of Ser. No. 601,624, Dec. 14, 1966, Pat. No. 3,501,184. This application Sept. 12, 1969, Ser. No. 871,066
Claims priority, application Germany, Dec. 14, 1965, D 48 905 X11/47a
Int. Cl. B23p *19/00*
U.S. Cl. 29—436 6 Claims



The present disclosure relates to an elastic coupling and a method for its construction wherein the elastic coupling includes an annular rigid outer member, a rigid inner member, an annular elastic intermediate member and side members. The inner, outer and intermediate members are constructed and assembled so that there is substantially no stressing of the intermediate elastic member. Thereafter, the side members are axially forced together to axially compress the elastic member and expand the elastic member into engagement with both the inner and outer members. At least one of the members is radially deformed to hold the side members in their axially displaced positions to produce a final assembly. The outer member may comprise a rigid ring and a plurality of arcuate sections of sheet metal having outward deformation axially engaging the ring at opposite axial ends to prevent relative axial movement; also, the arcuate sections being provided with outer portions that may be deformed inwardly to axially engage the side members after assembly and stressing of the elastic member. The outer member and adjacent surface of the elastic member may have cylindrical bearing surfaces. The inner member and the adjacent bearing surface of the intermediate elastic member may have engaging spherical surfaces. Furthermore, the side members may have spherical portions corresponding to the adjacent spherical portions of the inner member with the elastic member therein. The radial deformations between the arcuate sections and the ring of the outer member may be either formed simultaneously with the formation of the deformations engaging the side members or they may be preformed prior to the assembly of the outer member.

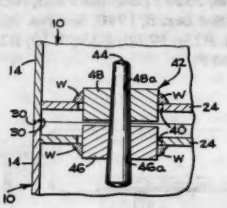
3,703,762

METHOD OF ALIGNING FORMS

Willard M. Lind, Lakeland, Fla., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 742,095, July 2, 1968, Pat. No. 3,603,557. This application April 12, 1971, Ser. No. 132,949
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 5 Claims

Concrete form sections are made ready for easy subsequent alignment by cutting aligned holes in the opposed end bulkheads of the sections to be aligned and placing between the sections and within the holes alignment devices each of which consist of a set of two apertured plugs which are received upon and snugly engaged with a tapered pin. Each plug of a set is welded to one of the opposing bulkheads and the pin is then removed to permit the form sections to be separated. When



the sections are subsequently aligned at the concrete pouring site, each pin is hammered back into snug engagement with its associated pair of plugs.

3,703,763

METHOD OF MAKING A COMPOSITE METAL ARTICLE

Currie B. Berry, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,876
Int. Cl. B23k *31/02, 35/12*
U.S. Cl. 29—503 12 Claims

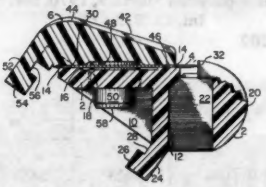
A method of making a composite article wherein a foamed aluminum article is bonded or brazed to a sheet aluminum article. Foamed aluminum and sheet aluminum are each pre-wet with molten zinc by abrading the materials or subjecting them to ultrasonic vibrations while submerged in molten zinc. The wetted metal surfaces are then brought together and the zinc melted and resolidified.

3,703,764

RAZOR BLADE ASSEMBLY

Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed March 15, 1971, Ser. No. 124,217
Int. Cl. B26b *21/06, 21/52*
U.S. Cl. 30—32 8 Claims



A razor blade assembly comprising razor blade means clamped between a platform member and a cap member. The platform and cap members are provided with dowel and aperture means by which they are connected together with the blade means held therebetween in assembled relationship, the dowels extending through holes in the blade means and the aforementioned aperture means and then expanded whereby to connect the assembly components together. The platform and cap members are further provided with runner means slidably engageable with complementarily shaped rail means of a razor handle.

3,703,765

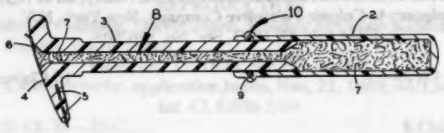
DISPOSABLE RAZOR

Gregorio A. Perez, 1925 S.W. 3rd Street, Miami, Fla.

Filed Aug. 4, 1971, Ser. No. 168,995
Int. Cl. B26b *21/06, 21/44;* B65d *47/34*
U.S. Cl. 30—41 6 Claims

A disposable razor in which a blade is molded therein with the edge thereof projecting from the shaving head and includ-

ing a telescopic handle over a stem which is secured central of the shaving head and having a coaxial bore in the stem including a quantity of shaving cream for projection through the bore from an outlet in the razor head when the handle is manually moved over the stem.



3,703,766

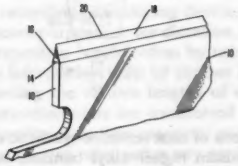
SAFETY RAZOR BLADE

Edward Camp Tibbals, 240 Brook Place, Boulder, Colo.

Filed July 20, 1970, Ser. No. 56,267

Int. Cl. B26b *21/54*

U.S. Cl. 30—346.53 **6 Claims**



Improved razor blade construction formed of a planar base element having a cutting edge compositely formed of a honed sapphire filament of fine cross section bonded to an intermediate layer of glass.

3,703,767

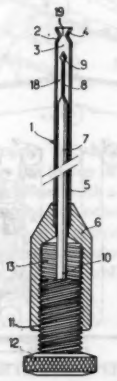
DENTAL INSTRUMENT FOR ROOT CANAL WORK

Jean Masseran, Metz-Magny, France, assignor to Micro-Mega, Metz-Magny, France

Filed July 2, 1971, Ser. No. 159,407

Int. Cl. A61c *5/02*

U.S. Cl. 32—57 **5 Claims**



A dental instrument for the extraction of filiform objects from the channels of extracted teeth, having a longitudinal tube on which is formed a first bearing surface, and a rod which is axially displaceable within the tube and which has a second cooperating bearing surface so that an object can be gripped between the two surfaces on longitudinal movement of the rod, and thereby extracted from the root channel.

3,703,768

DRAWING HEAD FOR USE IN DRAWING DEVICES

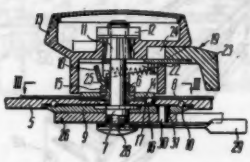
Evgeny Mikhailovich Perminov, Minsk, U.S.S.R., assignor to Minsky Opytny Zavod spetsialnogo Konstruktorskogo, Minsk, U.S.S.R.

Filed Nov. 4, 1970, Ser. No. 86,801

Claims priority, application U.S.S.R., Feb. 24, 1970, 1400963

Int. Cl. B43l *13/08*

U.S. Cl. 33—79 R **3 Claims**



A drawing head for use in drawing devices in which two flat members are mounted on a common axle and fixed relative to each other by means of spherical bodies disposed therebetween. The first flat member is associated with a means for moving the drawing head in the plane of the drafting board, and the second member with drawing scales through the intermediary of a square. The square is loosely mounted on the axle and is fixed relative to the second flat member by means of a friction clamp.

3,703,769

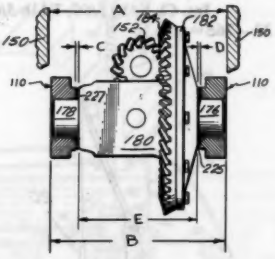
JIG MEASURING BLOCK AND USE OF THE SAME

Richard D. Pfeiffer, 9812 S. E. 5th, Bellevue, Wash.

Filed May 28, 1969, Ser. No. 828,610

Int. Cl. G01b *3/38*

U.S. Cl. 33—181 AT **22 Claims**



This invention is for a jig measuring block and the method of using the jig measuring block. The jig measuring block is of use in aligning gears in a differential, a transmission and final drives in small and large machinery such as small trucks, wheel-type vehicles, crawler vehicles, and industrial material handling machinery and the like. The jig measuring block makes it possible to save time, save material and to align the gears with greater accuracy in repairing such machinery. Further, it makes it possible for the small repair shops to economically and accurately repair such machinery.

3,703,770

ADJUSTABLE STRING PEEP

Howard S. Sofield, 100 Columbia Avenue, Lindenwold, N.J.

Filed June 16, 1970, Ser. No. 46,695

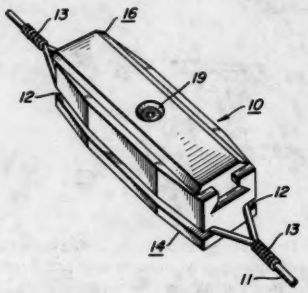
Int. Cl. F41g *1/00*; **F41b** *5/00*

U.S. Cl. 33—265 **4 Claims**

An adjustable "string peep" that is to provide a solid anchor for the archer who shoots a variety of distances while using a sight on the bow.

In the past an archer using a "string peep" in his bow-string would have two basic types to choose from. These two types consisted either of a hole or elongated slot through the center of the piece of material in the string commonly known in Archery as a "string peep."

An archer using the type with a hole through the center would find that he would have to "float" his anchor to see through the hole clearly when he moved the sight on the bow



down as he got farther away from the target. The other type of "peep" has an elongated slot in the center which would enable the archer to keep a "solid anchor" but the disadvantage of this type is that he would not be able to control his eye alignment up and down inside the elongated slot therefore loseing exact sight and string alignment. The disadvantage of all these types of "string peeps" is that they are not adjustable once they are tied into the bow-string.

3,703,771

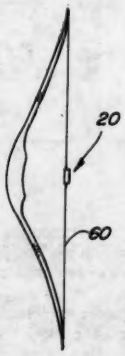
BOWSTRING-MOUNTED PEEP SIGHT

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Company, Columbus, Nebr.

Filed Feb. 10, 1971, Ser. No. 114,108

Int. Cl. F41g *1/00*; F41b *5/00*

U.S. Cl. 33—265 **6 Claims**



A bowstring-mounted peep sight including a body having vertically disposed side channels serving as housings and guides for carrying the strands of a divided multi-filament bowstring. A frame encircling the body of the sight and overlying the divided strands firmly embraces the peep sight body along opposed sides thereof, the frame including internally formed upper and lower bosses or hubs having axially disposed in-line passages adapted slidably to receive the bowstring therethrough, whereby the peep sight is conveniently secured on the bowstring in any selectable position. The body of the peep sight, adjacent the area of the sighting port, is provided with a grating-type surface contour to eliminate reflection and glare in the region of the port.

3,703,772

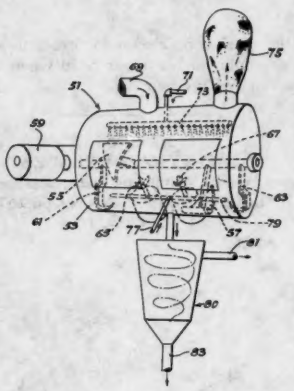
DRYING OF DETERGENTS

Neil Martin McHugh, Bridgewater; Clarence Scheurman, III, Green Brook, and Albert Lyle Schulerud, Nutley, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed July 27, 1971, Ser. No. 166,505

Int. Cl. F26b *3/00*

U.S. Cl. 34—9 **10 Claims**



Aqueous solutions of heat sensitive synthetic organic detergents, such as sodium higher alkyl benzene sulfonates, are dried by admixing such a solution with a very finely divided sorbent material, such as a water soluble builder or filler salt or an insoluble scouring material, thereby distributing the solution over a very greatly increased area, which speeds drying and prevents hot spots during drying, and drying the mixed detergent-sorbent-moisture particles.

3,703,773

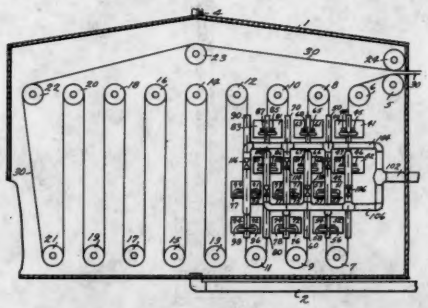
GAS PHASE REACTOR

James Paul Reid, Jr., and David S. Deskins, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed April 9, 1970, Ser. No. 26,904

Int. Cl. F26b *13/06*

U.S. Cl. 34—159 **4 Claims**

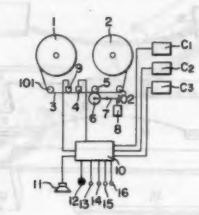


A method and apparatus are disclosed for the continuous treatment of fabrics containing cellulose with a gaseous mixture of formaldehyde and a catalytic amount of sulfur dioxide. The temperature and moisture content of the fabric to be treated are carefully controlled within a closed chamber as the fabric is first exposed to an atmosphere containing a non-explosive amount of formaldehyde vapor, then cured and dried within the closed chamber.

3,703,774
MAGNETIC RECORDING-REPRODUCING DEVICE CAPABLE OF AUTOMATIC REPETITIVE REPRODUCTION

Takeshi Goshima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1970, Ser. No. 90,407
Claims priority, application Japan, Nov. 21, 1969, 44/13434
Int. Cl. G09b 5/04
U.S. Cl. 35—35 C 8 Claims

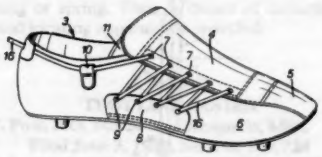


A magnetic recording-reproducing device, especially suitable for educational purposes or for dictation, which is capable of automatic repetitive reproduction by using a master tape storing therein information units of various lengths and time signals representing the various lengths of such information units. The information units are transferred from the master tape onto a plurality of endless magnetic recording mediums having different lengths, whereafter any particular one of the endless magnetic recording mediums is played back in accordance with a corresponding one of the time signals to thereby repeatedly reproduce the information unit on that particular medium.

3,703,775
FOOTBALL BOOTS

Joseph Gatti, 57 Oakwood Avenue, Beckenham, England

Filed Sept. 15, 1970, Ser. No. 72,443
Int. Cl. A43b 11/00
U.S. Cl. 36—2.5 AG 4 Claims



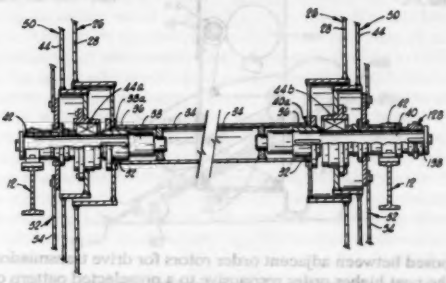
A football boot, the upper of which is provided with an outer shield which covers the instep of the wearer, each side edge of the shield being provided with a plurality of lace holes, preferably there being stitched or otherwise secured to each side of the upper a flap which is provided with a plurality of corresponding lace holes, the lace holes being located so that the lacings may fasten the shield centrally or to the left or right of the instep of the wearer as desired.

3,703,776
EARTH SCRAPER

Robert B. Feistel, Jr., Oklahoma City, Okla., assignor to HSH, Inc., Oklahoma City, Okla.

Filed Oct. 15, 1970, Ser. No. 80,963
Int. Cl. B60p 1/00; A01b 5/00
U.S. Cl. 37—9 7 Claims

An earth scraper of the type having a support frame, wheels journaled on the support frame to support the earth scraper as it rolls over the ground, a bowl for accumulating and discharging scraped earth, scoop means for scraping earth, and earth elevating means for depositing scraped earth in the bowl. The scraper of the invention has hydraulic actuation means for positioning the bowl in earth accumulation or discharge positions, hydraulic actuation means for elevating and depressing

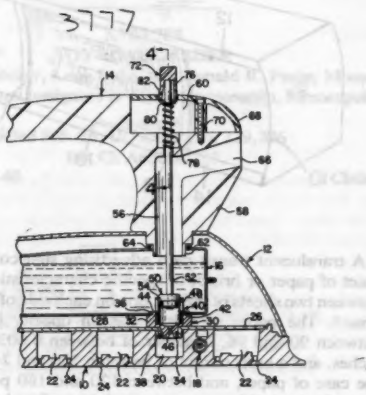


the scoop means relative to the support frame and for raising and lowering the support frame relative to the ground, and means for connecting the earth scraper to a tractor. Means for journaling the bowl, earth elevating means and scoop means in the support frame is also disclosed.

3,703,777
STEAM-DRY IRON

Robert S. Knapp, St. Louis, Mo., assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 6, 1971, Ser. No. 104,252
Int. Cl. D06f 75/06
U.S. Cl. 38—77.83 11 Claims



A steam-dry iron which may be selectively operated to (1) produce steam at a predetermined normal rate; (2) operated to produce a momentary pulse of steam at a rate greater than such normal rate, or (3) operated as a dry iron with no steam being produced.

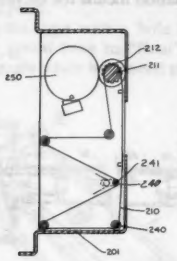
3,703,778
PLURAL COLUMN CHANGEABLE DISPLAY MECHANISM

Frederick W. Pfleger, 1152 Barbara Drive, Cherry Hill, N.J.

Filed April 27, 1970, Ser. No. 31,980
Int. Cl. G09f 11/18
U.S. Cl. 40—32 3 Claims

A plural column display device or register wherein at least a pair of lower and higher order column rotors have extending thereacross respective lower and higher order tapes which carry suitable indicia and are shiftable by their associated rotors for presentation of indicia at a display location.

A cyclic drive means is operatively connected to the lower order rotor and a normally inactive drive transfer means is interposed between adjacent order rotors for drive transmission to the next higher order responsive to a preselected pattern of control associated with the lower order column.

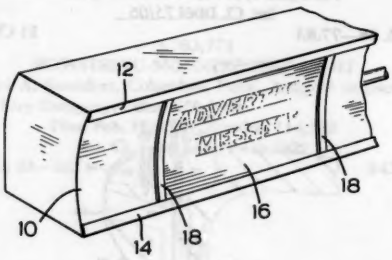


3,703,779

TRANSLUCENT SIGN

Allan Goldman, 23 Overbank Crescent, Don Mills, Ontario, Canada

Filed Nov. 14, 1969, Ser. No. 876,807
Int. Cl. G09f *1/02*
U.S. Cl. 40—135 **5 Claims**



A translucent transit card advertising sign consisting of a sheet of paper or bristol of specific characteristics laminated between two sheets of plastic, one on each side of the paper or bristol. The paper or bristol has an opacity in the range between 90 and 96, a caliper of between 0.003 and 0.0065 inches, and a basis weight of between 120 and 240 pounds in the case of paper, and between 120 and 180 pounds in the case of bristol. When paper is used, its surface is clay coated. The plastic sheets each have a thickness of between 0.0015 and 0.005 inches. In some cases the plastic may be laminated only to one side of the paper or bristol and in that case the plastic thickness will be between 0.0015 and 0.010 inches.

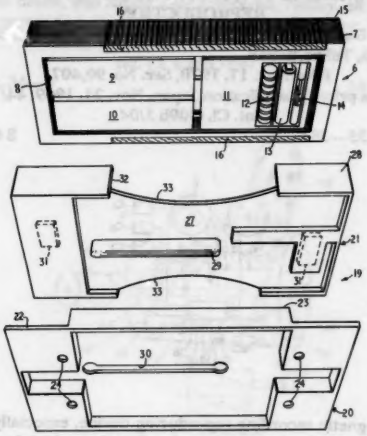
3,703,780

EXPLOSIVE CHARGE DEVICE AND ASSEMBLY

George King, 458 Bexley Road, Bexley, New South Wales, Australia

Filed Aug. 11, 1970, Ser. No. 62,842
Int. Cl. F41c *27/00*
U.S. Cl. 42—1 R **9 Claims**

A device for assisting in the apprehension of persons responsible for bank robberies and the like, the device having the external appearance of a bundle of currency notes and being provided with an internal compartment housing an explosive charge and electrical circuit means operating with a time delay for automatically firing the charge. A magnetic switch controls the energization of the electrical circuit and has a set of contacts normally maintained in an off position by a magnet in a holder for the device and when the device is handed over upon demand during a robbery, the magnetic switch moves away from the magnet and closes the electrical circuit.

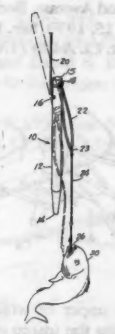


3,703,781

FISHING DEVICE

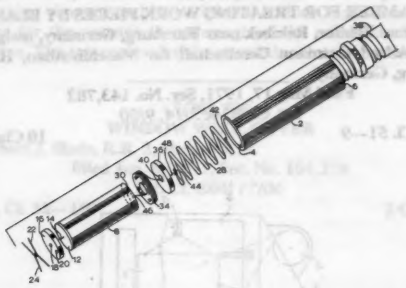
Bobby T. Walker, Route 3, Box 356, Monroe, La., and Vincent F. Danna, Route 2, Box 442-A, West Monroe, La.

Filed Dec. 11, 1970, Ser. No. 97,198
Int. Cl. A01k *97/12*
U.S. Cl. 43—16 **9 Claims**



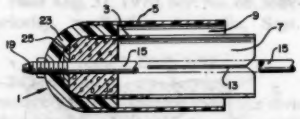
A fishing device for setting a hook in a fish, playing the fish, and indicating that the fish has been hooked. The device comprises a shaft tapering at one end to a tip portion, and having connected thereto at its opposite end an elastic band having an unstretched length sufficient to reach the tip portion but being stretchable to engage the tip portion. A main fishing line is connected to the shaft at a point adjacent to the connection point of the elastic band but in closer proximity to the tip portion. A fish hook supporting line is connected to the elastic band at its tip-engaging portion. The elastic band when stretched to engage the top portion is releasable therefrom by a pull on the fish hook supporting line. When the device is triggered, the elastic band acts to set the hook in the fish and play the fish until retrieved by the fisherman, and the shaft swings backwards and forwards to act as an indicator to the fisherman that the fish has been hooked.

3,703,782
PRESSURE SENSITIVE APPARATUS
William B. Brown, 522 West 39th Street, Topeka, Kans.
Filed Feb. 4, 1971, Ser. No. 112,607
Int. Cl. A01k *87/00*; B63c *7/26*
U.S. Cl. 43—23 32 Claims



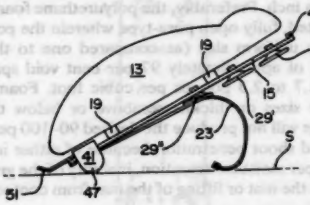
A housing having a housing open end is provided. A hollow member having a hollow member opening is slidably positioned in the housing with the hollow member opening facing the housing open end. A resilient diaphragm is mounted over the hollow member opening. A pin is mounted to the resilient diaphragm. A pin guide having a pin guide hole is slidably positioned in the housing so that the pin projects through the pin guide hole. A first strand loop and second strand loop are mounted oppositely to the housing and snugly looped over the part of the pin projecting from the pin guide hole. A biasing means is provided for urging the hollow member toward the housing open end. The biasing means can be liquid pressure as when the pressure sensitive apparatus is submerged upright in liquid, gravity when the housing open end is pointed downwardly or a spring. In operation, when the ambient pressure sufficiently exceeds the pressure in the hollow member, the diaphragm and pin move into the hollow member. When the pin moves below the surface of the pin guide the first strand loop and second strand loop slip off the pin and allow the hollow member to be urged out of the housing. A locating strand can be mounted at opposite ends to the hollow member and housing or spring. Thus, a means of detecting pressure changes and locating apparatus is provided.

3,703,783
TROT LINE CASTER
Samuel T. Pool, P.O. Box 2014, Pascagoula, Miss.
Filed June 3, 1971, Ser. No. 149,724
Int. Cl. A01k *97/06*, *91/02*
U.S. Cl. 43—54.5 A 10 Claims



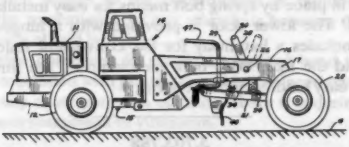
A caster for a fishing line carrying a plurality of spaced baited hooks, comprising a guide weight to which a pair of concentric shells are at one end connected, with the other end of said concentric shells left open to provide an accessible inner chamber for baited hooks and an accessible surrounding chamber for storage of line to which the hooks are connected, said concentric shells having at least one slot running longitudinally from the open end of each toward the guide weight.

3,703,784
MULTIPLE JUMPING DEVICE
Voorhis F. Wigal, Box 1542, Jackson, Tenn.
Filed March 16, 1972, Ser. No. 235,158
Int. Cl. H63h *13/02*
U.S. Cl. 46—129 5 Claims



A spring-powered device which, after being properly set, is placed on a support surface and the device then jumps upwardly several times. The device includes a body member which may have any one of several configurations thereto, e.g., an animal or a bug. A frame is included and has a row of suction cups attached thereto. Additionally, a broad elongated spring is included which has one of its ends attached to the frame, with the other of its ends being free to assume a curled disposition when relaxed. The spring normally curls downwardly away from the frame, and urging the spring into a straight disposition is effective to engage the suction cups therewith. The suction cups sequentially release respective portions of the free end of the spring to yield a snapping action against a supporting surface with each release which causes the device to jump repeatedly.

3,703,785
TOY ROAD GRADER
Lee J. Pfeilsticker, Long Lake, and Ronald R. Pauly, Mound, both of Minn., assignors to Tonka Corporation, Minneapolis, Minn.
Filed Feb. 25, 1972, Ser. No. 229,296
Int. Cl. A63h *33/30*
U.S. Cl. 46—40 5 Claims



A toy road grader having a grader blade mounted crosswise on the underside of the front portion of the grader body which is yieldably held in a raised position above the ground surface under spring tension and connected to an upright handle mounted on the body for rocker movement about a transverse axis whereby as the handle is swung forwardly it will lower the blade against said spring tension into engagement with the ground surface. The blade is pivoted on a vertical axis and is adjustable between different locked angular positions relative to the line of travel.

3,703,786
GRASS SEED MAT
Donald M. Swan, 28757 Chatham Road, Grosse Ile, Mich.
Filed June 23, 1971, Ser. No. 156,080
Int. Cl. A01g *31/00*
U.S. Cl. 47—56 3 Claims

A grass seed mat for the germination and growing of grass seed when placed in contact with a soil surface consists of a

sheet of polyurethane foam material with grass seeds attached to one side by means of a water-soluble glue or adhesive. In order for the mat to provide the dual functions of providing adequate moisture retention (mulching effect) and penetration of the grass shoots through the mat, achieving an optimum 90–100 percent seed germination and growth, the pore or cell size of the foam material must be in the critical range of 35 to 40 pores per lineal inch and a thickness of between 4/64 to 6/64 of an inch. Preferably, the polyurethane foam material is a reticulated, fully open pore-type wherein the pores are of substantially uniform size (as compared one to the other), with a total of approximately 97 per cent void space and a density of 1.7 to 2.3 pounds per cubic foot. Foam material having pore sizes or thicknessesabove or below this stated critical range will not produce the desired 90–100 percent germination and shoot penetration because of either inability to provide proper moisture retention, inability of the grass shoots to penetrate the mat or lifting of the mat from contact with the soil surface.

3,703,787

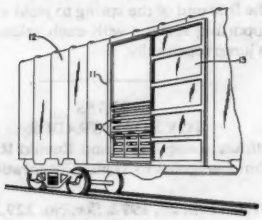
PERMANENT, SAFETY, INNER DOORS FOR FREIGHT CARS

Juan Francisco Zendejas Gomez, Av. San Antonio N. 307, Mexico City, Mexico (18, D.F.)

Continuation-in-part of Ser. No. 874,129, Nov. 10, 1969. This application July 13, 1971, Ser. No. 162,197

Int. Cl. E06b *3/32*

U.S. Cl. 49—169 **5 Claims**



The invention is directed to novel inner doors adapted to fit the door frame, within the sliding doors of a freight car. The inner doors comprise upper and lower doors adapted to be secured in place by spring bolt means for easy installation and removal. The lower door is provided with a hinged section which includes a hatchway for the convenient unloading of grain and the like. With bulk merchandise, the inner doors provide easy loading and unloading.

3,703,788

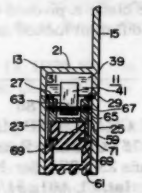
AUTOMATIC DOOR BOTTOM

Victor J. Rivers, San Leandro, Calif., assignor to Pemko Manufacturing Co., Emeryville, Calif.

Filed Oct. 1, 1970, Ser. No. 77,283

Int. Cl. E06b *7/20*

U.S. Cl. 49—307 **8 Claims**



An automatic door bottom to seal the gap between the bottom of a door and the door sill. The seal element is held in a channel mounted on a door and includes a spring loaded slidable pushrod which upon closure of the door forces the seal from the channel and into contact with the door sill, and upon opening, the slidable pushrod is released and the spring retracts the seal back into the channel.

3,703,789

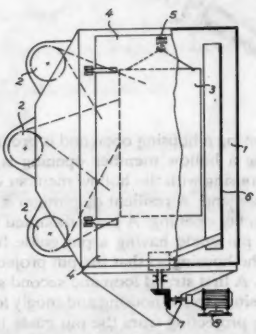
CHAMBER FOR TREATING WORK PIECES BY BLAST

Johannes Zeidler, Reinbek near Hamburg, Germany, assignor to Alfred Gutmann Gesellschaft fur Maschinenbau, Hamburg, Germany

Filed May 17, 1971, Ser. No. 143,782

Int. Cl. B24c *3/14, 9/00*

U.S. Cl. 51—9 **10 Claims**



The specification discloses a chamber for treating work pieces by a blasting medium in which blasting devices discharge the medium into the chamber in a side opening in the chamber. Doors are provided for the chamber to permit work pieces to be placed into the chamber and removed therefrom. Also included in the chamber is a shield which moves in front of the opening for the blasting medium before the doors are opened and which moves to a position opposite the opening when the doors are closed. A control device controls the supply of blasting medium to the blasting devices and an automatic control system is provided for correlating the operation of the various devices.

3,703,790

ACCESSORY FOR ADHESIVELY FIXING AND BONDING FASTENING ELEMENTS IN FIXING HOLES

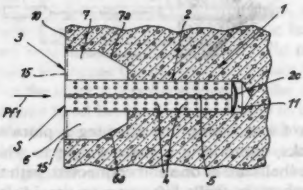
Heinz Otto Mattes, and Friedrich Flesch, both of Emmendingen, Germany, assignors to Max Langenslepen Kom. Ges., Emmendingen, Germany

Filed Jan. 19, 1971, Ser. No. 107,752

Claims priority, application Germany, Jan. 22, 1970, G 70 02 080.3

Int. Cl. E04b *1/38, 1/41*

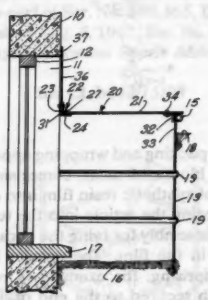
U.S. Cl. 52—98 **7 Claims**



An accessory for adhesively fixing and bonding fastening elements in fixing holes, particularly in soft building materials, by the destruction inside a fixing hole of a cartridge containing

an adhesive, preferably the two components of a two-component adhesive, and distributing the adhesive after its release. The accessory has the form of an insertion comprising a protective sleeve accommodating an adhesive-filled cartridge. The protective sleeve has an external diameter adapted to fit into a fixing hole and an internal diameter to fit around a fastening element that is to be secured in the fixing hole. The length of the protective sleeve corresponds to the length of the fastening element and its peripheral surface is provided with holes for the passage therethrough of the adhesive after its release. The external end of the protective sleeve is open.

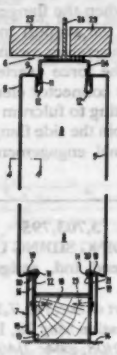
3,703,791
WINDOW WELL COVER
Herbert J. Slade, R.R. 2, Harvard, Ill.
Filed Jan. 6, 1971, Ser. No. 104,278
Int. Cl. E04f *17/06*
U.S. Cl. 52—107 **2 Claims**



A window well cover of the type having a light-transmitting sheet selectively sized to cover an open top of a window well is characterized by an elongated, reinforcing, metal strip extending parallel to, and disposed near, a foundation wall. The metal strip has a horizontal portion formed with an elongated slot receiving and firmly supporting the adjoining sheet edge, which is tightly clamped in the slot. An upstanding portion of the rigidifying strip enhances the vertical rigidity of the window well cover and forms a base for supporting an upstanding sheet of light-transmitting material which serves as a storm window for that portion of a basement window projecting above the window well.

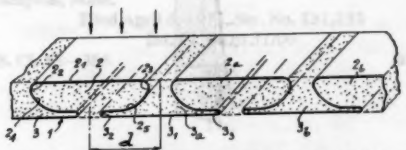
3,703,792
WALL STRUCTURE
David H. Bill, 56 Jacana Avenue, Lower Templestowe, Victoria, Australia
Filed Aug. 31, 1970, Ser. No. 68,366
Claims priority, application Australia, Sept. 5, 1969, 60526/69
Int. Cl. E04b *2/82*
U.S. Cl. 52—242 **4 Claims**

A wall structure which is adapted to form a dividing wall or partition within a building. The construction consists of upper and lower support members which extend along the length of the wall. One or more wall panel members are detachably connected to the supports and are supported thereby. Each panel consists essentially of a flat pressed-steel sheet having a flange or ledge arrangement extending around the perimeter thereof. The ledge along the upper edge of the panel supports one or more substantially U-shaped clips which are adapted to engage a downwardly extending flange of the upper support member and detachably locate the upper edge of the panel. The ledge along the lower edge of the panel forms an inverted channel which engages a complementary channel along the lower support member to locate and support the panel. The ledges or flanges along the vertical edges of the panel provide rigidity to the panel and also provide means whereby adjacent



panels may be interlocked when a wall consists of more than one panel. The wall may consist of two rows of the above described panels, the rows being spaced apart in a transverse direction to provide a central cavity therebetween.

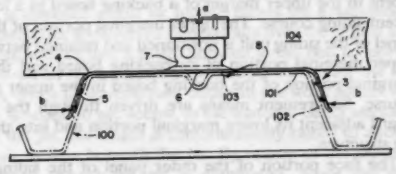
3,703,793
DECREASING FLEXIBILITY APERIODIC RESILIENT DEVICE FOR FLOORS, PARTITION WALLS AND LIKE BUILDING MEMBERS
Bernard Barrat, Neuilly-sur-Seine, France, assignor to Productions Essemes S.A., Pierrefitte, Seine Saint-Denis, France
Filed April 21, 1970, Ser. No. 30,464
Int. Cl. E04b *1/62*; E04f *15/22*
U.S. Cl. 52—403 **7 Claims**



The device relates to the construction of buildings and prevents the transmission of any vibrations between the constitutive parts of said buildings.

The device comprises an elastic corrugated band to form opposed loops filled with plastic foam, and is placed between a floor and any other part of a building where it is desirable to prevent the transmission of vibrations.

3,703,794
STRUCTURAL RETAINER CLIP
Andrew Gracon, Cleveland, Ohio, and George A. Tinnerman, 3600 Stewart Avenue, Miami, Fla., assignors to said Tinnerman, by said Gracon
Filed April 28, 1970, Ser. No. 32,519
Int. Cl. E04b *1/40*
U.S. Cl. 52—506 **15 Claims**



The structural retainer clip formed by a hardened, resilient sheet metal clip element having a pair of opposed flanges con-

nected by a base, and a connector element connected to the side of the center section of the base opposite the flanges. The flanges of the clip element are formed with teeth to grip a support member embraced by the flanges, such as a corrugation of a corrugated deck, when the flanges are spread by forcing the clip element on to the support member. The connector element is provided with retainer means to secure an article to the support member, the force exerted by the article being transmitted through the connector element to the center section of the base, and acting to fulcrum the side sections about curved sections which join the side flanges to the base, thereby augmenting the frictional engagement of the teeth of the flanges.

3,703,795

BUILDING SIDING UNITS

Lee H. Mattes, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 7,123, Jan. 30, 1970, abandoned. This application May 28, 1971, Ser. No. 148,015

Int. Cl. E04b *2/08;* **E04c** *2/46;* **E04d** *3/362*

U.S. Cl. 52—521 **7 Claims**

A siding unit for a building having an outer panel and a backing board. The outer panel includes an upper marginal portion having a generally horizontal web which extends rearwardly from the face portion of the panel and which terminates in an upturned generally vertical lip. The outer panel also includes a retainer part which extends along the upper marginal portion thereof. The retainer part extends below the web of the upper marginal portion. The outer panel includes a lower marginal or butt portion which interlocks with the panel retainer part of the siding unit in the lower adjacent siding course. The backing board of the siding unit includes upper and lower margins and has its lower margin positioned adjacent to the upper margin of a backing board in a lower adjacent siding course. The upper marginal portion of the outer panel of the siding unit is positioned and retained between the upper marginal portion of its backing board and the lower marginal portion of the backing board in the upper adjacent course. Securement means are driven through the backing board adjacent its lower marginal portion and into the building structure.

The face portion of the outer panel of the siding unit is spaced sufficiently from its backing board at one or more locations so as to define air spaces between the outer panel and its backing board.

3,703,796

AUTOMATIC PACKING AND WRAPPING APPARATUS

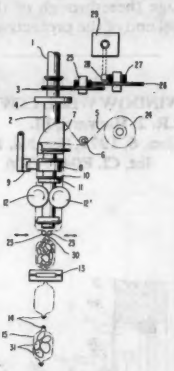
Kiyoshi Inoue; Tetsuo Ishikawa, and Shingo Okada, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Feb. 12, 1971, Ser. No. 114,850

Claims priority, application Japan, Feb. 12, 1970, 45/11460

Int. Cl. B65b *9/12, 51/04*

U.S. Cl. 53—180 **5 Claims**



An automatic packing and wrapping apparatus for wrapping articles such as blocks of meat, comprising an assembly for forming a strip of synthetic resin film into a tubular shape, an assembly for feeding the article into the tubular film through nozzles, and an assembly for tying the ends of the film so as to seal the article in the film. The nozzles include a crushing mechanism comprising, for example, a rotary cutter and a fixed cutter each secured to the end of a respective nozzle. The article is crushed by the crushing mechanism at predetermined intervals to form alternate bulky and slender portions for every given length of the article in the film. The article portions within the film are pinched and squeezed by a pair of pinch rollers, and then the surrounding film is tied with metal clips or the like.

3,703,797

ADSORPTION PROCESS FOR THE COMPLETE AND NON-DISSIPATIVE SEPARATION OF A GAS MIXTURE INTO ADSORBABLE AND NON-ADSORBABLE, IN PARTICULAR RADIOACTIVE COMPONENTS

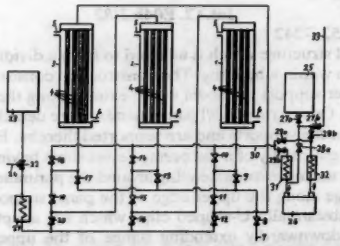
Manfred F. Lepold, Merzenich Uber Dueren; Gerhard Heinze, Schildgen; Gustav Kaule, Cologne-Stammheim, and Ernst Podschus, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 5, 1969, Ser. No. 855,697

Claims priority, application Germany, Sept. 13, 1968, P 17 94 140.1

Int. Cl. B01d *53/04*

U.S. Cl. 55—62 **5 Claims**



Process for the complete separation of an adsorbable gas component A from another substantially non-adsorbable gas

component B in at least two adsorption zones 1 and 2 arranged one behind the other, comprising the following steps:

a. in the first step the adsorption zone 1 is loaded until completely saturated with the component A;
b. in the second step the feed gas in the interstitial volume of adsorption zone 1 is displaced with pure component A from a storage means and the sweeping gas, optionally together with the feed gas is delivered to the partially unloaded zone 2;
c. in the third step the pure component A is liberated by heating of zone 1 and is delivered to a storage means. Thereafter the aforesaid steps are repeated however with interchanged functions of zones 1 and 2.

3,703,798

RELATING TO THREE-DIMENSIONAL CHROMATOGRAPHIC SYSTEMS

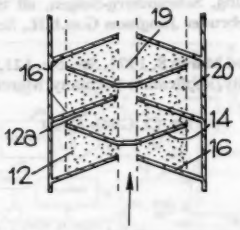
Victor Pretorius, "Klein Waterkloof," Club Avenue, Waterkloof, Pretoria, Transvaal, and Hans Helmut Hahn, 38, Marais Street, Bailey's Muckleneuk, Pretoria, Transvaal, both of Republic of South Africa

Continuation-in-part of Ser. No. 548,900, May 10, 1966, and a continuation-in-part of Ser. No. 598,365, Dec. 1, 1966. This application Aug. 4, 1967, Ser. No. 658,545

Claims priority, application South Africa, Aug. 5, 1966, 66/4669

Int. Cl. B01d *15/08*

U.S. Cl. 55—67 **37 Claims**



Elution in three-dimensional chromatographic systems is carried out in a direction of increasing cross-section. This is achieved with specially constructed apparatus or with columns modified by internals prescribing a path of ever increasing cross-section. A continuous elution based on improved sample introduction by impregnating a porous section containing a retarding phase with the sample and displacing the section into a position in advance of the separating system proper.

3,703,799

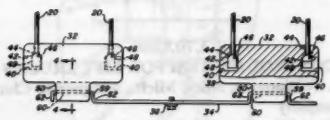
DISCHARGE ELECTRODE TENSIONING MEANS

Wendell Lewis Humphreys, 2364 Ganesha Avenue, Altadena, Calif.

Filed Oct. 22, 1969, Ser. No. 868,358

Int. Cl. B03c *3/41*

U.S. Cl. 55—147 **11 Claims**



Discharge electrode tensioning means and more particularly a means for post-tensioning a discharge electrode used in a precipitator and aligning such electrodes to maintain a spaced charge.

3,703,800

HUMID DE-DUSTING DEVICE FOR GAS-CONVEYOR CONDUITS

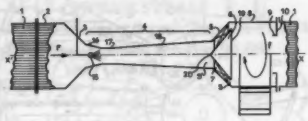
Paul Courbon, Oise, France, assignor to Charbonnages De France, Paris, France

Filed March 24, 1971, Ser. No. 127,635

Claims priority, application France, April 8, 1970, 7012770

Int. Cl. B01d *47/10*

U.S. Cl. 55—238 **7 Claims**



Device intended to free a flow of gas from the dust and solid particles which it carries in suspension.

It comprises a venturi wherein water is sprayed and which is comprised between a junction converging portion having a apex angle in the vicinity of 90° and a junction diverging portion having an apex angle in the vicinity of 90°. This latter is provided, on the one hand, with means for setting into rotation the flow of humidified gas, on the other hand, with a centrifugal separation conduit with an axial transfer sleeve.

This de-duster device may be inserted into a conduit system of ventilation air such as the ventilation pipes of underground mine workings.

3,703,801

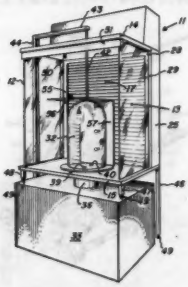
CLEAN AIR WORK STATION

Peter C. Deckas, Edina, Minn., assignor to Dexon, Inc., Minneapolis, Minn.

Filed April 5, 1971, Ser. No. 131,132

Int. Cl. B01d *31/00*

U.S. Cl. 55—385 **8 Claims**

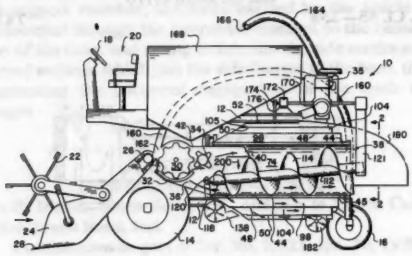


A clear air work station having a horizontal work surface on which is disposed a bell jar having means for evacuating the jar. Filtered air is delivered horizontally over the region above the work surface and a shield secured to the bell jar prevents the filtered air from engaging the bell jar except for the lower portion of the jar immediately adjacent the work panel. When the jar is raised to get access to the material being worked on within the jar, the shield is simultaneously raised to allow filtered air to flow beneath the jar. By reason of the shield, air turbulence around the jar is eliminated. Since the shield moves with the jar, the total flow of filtered air remains constant regardless of the position of the bell jar.

3,703,802
COMBINE APPARATUS

Frank Wrestler, R.R. No. 1; Harry J. Swift, R.R. No. 4, and Edgar R. Wrestler, R.R. No. 1, all of Hartford City, Ind.

Filed Jan. 20, 1972, Ser. No. 219,321
Int. Cl. A01f *12/44*
U.S. Cl. 56—13.3 15 Claims

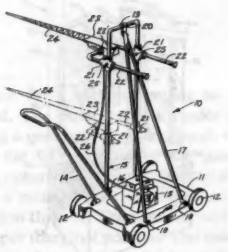


The invention is a combine apparatus for harvesting field crops comprising in combination a vehicular supporting frame, means mounted on the frame for severing and disjoining the stalk and fruit portions of a field crop and producing a discharge thereof. Rotatably mounted on the supporting frame are a plurality of concentrically disposed, hollow cylindrical drums having foraminous walls which define a plurality of chambers. The innermost chamber is positioned to receive the discharge from the threshing means and the openings in the foraminous walls are graduated to pass the fruit portions, grain portions, and refuse material of the crop, respectively, and to retain the stem, tailings, and grain portions of the crop, respectively. Within each of the chambers there are provided auger means for forcibly moving the grain axially therethrough.

3,703,803
MOBILE VARIABLE HEAD, HEDGE TRIMMER

James N. McClure, Box 64, Oklaunion, Tex.

Filed Jan. 31, 1972, Ser. No. 222,064
Int. Cl. A01d *55/00*
U.S. Cl. 56—237 4 Claims



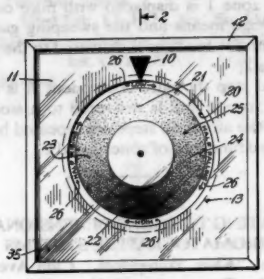
A device for trimming hedges. This device consists primarily of a power driven base with elevatable portions for raising and lowering the trimmer head containing a shears.

3,703,804
TIDE INDICATOR CLOCK

Gustaf T. Appelberg, Fairfield, Conn., assignor to Fairfield County Marine, Inc., Fairfield, Conn.

Filed May 14, 1971, Ser. No. 143,539
Int. Cl. G04b *19/26*
U.S. Cl. 58—3 5 Claims

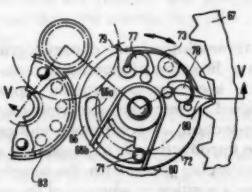
A simplified tide indicator clock having a dial and an indicating element for cooperating therewith and relatively movable through a complete cycle from low tide to high tide and back to low tide in 12 hours and 25 minutes, said dial having pictorial indicia thereon progressively illustrating the change in tide conditions so as to graphically designate the present status of the tide for a given location.



3,703,805
ELECTRIC TIMEPIECE WITH DATE DIAL

Wolfgang Ganter, Schramberg-Sulgen; Heinz Otto, Rotenberg, and Josef King, Schramberg-Sulgen, all of Germany, assignors to Gebruder Junghans G.m.b.H., Schramberg, Germany

Filed March 8, 1971, Ser. No. 121,820
Claims priority, application Germany, March 11, 1970, P 20 11 568.8
Int. Cl. G04b *19/24*
U.S. Cl. 58—5 10 Claims



A setting mechanism for an electric timepiece including adjustment elements mounted for pivotal movement by a setting shaft. The setting shaft is shiftable axially between a plurality of functional positions so that the adjustment elements will either engage a date disk or a mechanism for the timepiece hands and impart thereto a pivotal motion to thereby set the date disk and the hands to the desired position. A resilient restoring means, cooperating with a stop means, automatically provides a "neutral" position for the adjustment elements, disengaged from the date disk and hour wheel.

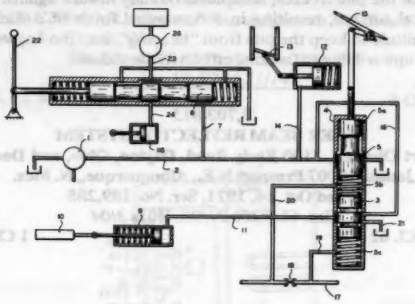
3,703,806
CONTROL SYSTEM FOR LIFT TRUCKS

William A. Williamson, Niles, Mich., assignor to Clark Equipment Company

Division of Ser. No. 791,354, Jan. 15, 1969, Pat. No. 3,595,343. This application Nov. 13, 1970, Ser. No. 89,444
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 5 Claims

The system employs hydrostatic drive for a lift truck in combination with hydraulic system elements which control not

only the hydrostatic drive and truck speed through the accelerator setting, but also afford elements and controls for actuation of the lift mechanism which make possible a speed up of the engine to provide a fast lift while the truck is driven at a controlled slow speed.

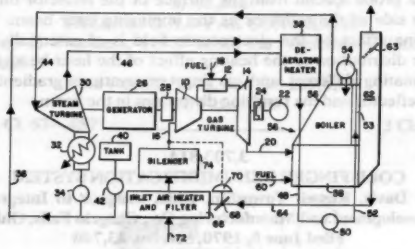


3,703,807

COMBINED GAS-STEAM TURBINE POWER PLANT

Ivan G. Rice, Spring, Tex., assignor to De Laval Turbine Inc., Trenton, N.J.

Filed Jan. 15, 1971, Ser. No. 106,724
Int. Cl. F02c *7/08*
U.S. Cl. 60—39.18 B **5 Claims**



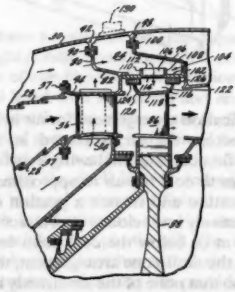
In a combined gas-steam turbine power plant, part-load heat rate is improved by recirculating the boiler stack gas into the air inlet of the turbine compressor section.

3,703,808

TURBINE BLADE TIP COOLING AIR EXPANDER

Eldon M. Stearns, Lebanon, Ohio, assignor to General Electric Company

Filed Dec. 18, 1970, Ser. No. 99,572
Int. Cl. F02c *7/12*
U.S. Cl. 60—39.66 **10 Claims**



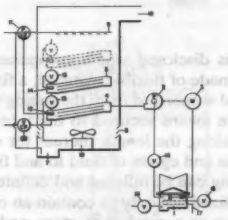
A turbomachinery cooling structure wherein cooling air is delivered around a combustor to a chamber formed by stationary structure above the tips of rotating blading. Means are provided, in the form of stationary vanes of airfoil cross section, to accelerate the cooling air and to deliver the same as a tangential flow to a cavity formed above the blading. The cavity is formed by means of a rotating blade shroud, which cooperates with the above-mentioned stationary structure. The cooling air is then delivered to an internal cooling passageway of the blading.

3,703,809

PRESSURE PROCESS FOR CONDENSING POWER HOUSE STEAM

James L. Cassidy, 66 Prospect Street, Turners Falls, Mass.

Filed Dec. 3, 1970, Ser. No. 94,881
Int. Cl. F01n *7/00*
U.S. Cl. 60—95 **4 Claims**



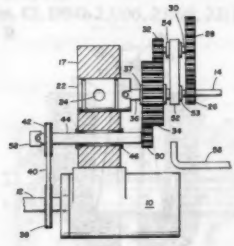
A method of operating a steam turbine system comprising, leading the steam from the turbine to a pump automatically regulated to maintain a low pressure for preventing turbine back-pressure at all turbine loads, leading the steam from the pump to a heat-exchanger and condenser wherein it is allowed to build up pressure to a desired level, setting that level externally and automatically maintaining that level internally within reasonable limits by varying the surface area of heat exchange being used.

3,703,810

SPEED CONTROL APPARATUS

James L. Rawson, and Leslie E. Rawson, both of P. O. Box 217, Atkins, Iowa

Filed Oct. 14, 1970, Ser. No. 80,558
Int. Cl. F01b *21/04;* **F01l** *33/02*
U.S. Cl. 60—97 S **9 Claims**



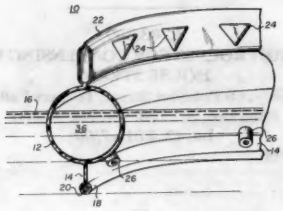
A control apparatus for synchronizing the speed of a rotating member with a variable speed input or for producing angular displacement of an output shaft in response to an input signal. The apparatus achieves correlation between the input and output by the use of a mechanical gear arrangement between the input and output shafts which arrangement produces angular displacement of a control member upon receipt of an input pulse or up variation of the speed of the input shaft from the output shaft. This displacement is then utilized to regulate an electrical speed control device, the flow to a hydraulic actuator, or a mechanical variable speed drive which adjusts the speed or displacement of the output shaft accordingly.

3,703,811

OIL BOOM WITH CONTINUOUS CONDUIT THERETHROUGH

Wilbur C. Smith, North Caldwell, N.J., assignor to Worthington Corporation, Harrison, N.J.

Filed Aug. 28, 1970, Ser. No. 67,858
Int. Cl. E02b *15/04;* **B01d** *17/02*
U.S. Cl. 61—1 F **8 Claims**



An oil boom is disclosed which comprises a continuous length of tubing made of flexible material; a first weighted fin of flexing material suspended from the tubing along its length thereof; and valve means secured to the tubing at predetermined locations along the length thereof for selectively permitting the ingress and egress of fluid to and from the tubing, whereby the tubing can be inflated and deflated. Thus the oil boom may be utilized not only to contain an oil slick floating on water, but also as a conduit to store and/or transfer oil which has been removed therefrom. In the preferred embodiment, the boom is further provided with a second fin of flexible material upstanding from the tubing along its length thereof with the second fin having floatation means therein for floating the boom and for increasing the buoyancy of the oil boom should the boom be lowered into the water. One or more lengths of oil boom of the invention may be joined in end to end relationship by connection means which join the lengths of tubing with fluid communication established therebetween.

3,703,812

HEAVE-PROOF ARCTIC PILING

George R. Newton, Tulsa, Okla., assignor to Amoco Production Company

Filed Nov. 13, 1970, Ser. No. 93,764
Int. Cl. E02d *5/44*
U.S. Cl. 61—53 **3 Claims**

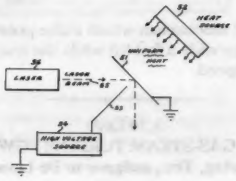
Piling projecting at the upper part through tundra are protected from ground movement in an upward direction due to periodic freezings and thawings of the tundra by being fixed to conically shaped collars extending down from the surface of the earth, with the base of the cone down. The conical portion thus becomes a part of the pile, mechanically speaking. If desired, the conically shaped part may be an integral part of the pile. As the liquid part of the tundra surrounding the upper part of the pile freezes, it expands radially inward against the conical surface, resulting in a downward force of sufficient magnitude to keep the pile from "heaving", i.e., moving vertically upward due to freezing effects in the ground.

3,703,813

LASER BEAM REFLECTOR SYSTEM

Albert Olevitch, 3100 Early Road, Dayton, Ohio, and Darrell R. James, 12007 Prospect N.E., Albuquerque,, N. Mex.

Filed Oct. 14, 1971, Ser. No. 189,285
Int. Cl. F25b *21/00;* **H01s** *3/04*
U.S. Cl. 62—3 **1 Claim**



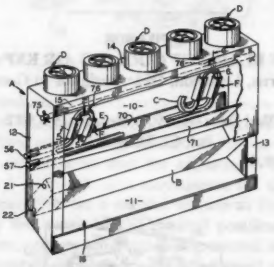
An electrically conductive laser beam reflector is cooled by a high voltage electrostatic field created between the reflector and a probe spaced from the surface of the reflector on the same side of the reflector as the impinging laser beam. The cooling effect by the electrostatic field is of essentially the same distribution as the heating effect of the laser beam thus eliminating different and varying temperatures gradients in the reflector and the resulting distortions in the beam.

3,703,814

COLD FINGER DEHUMIDIFICATION SYSTEM

Noel Davis, Russell Township, Ohio, assignor to Integrated Development and Manufacturing Co., Chagrin Falls, Ohio

Filed June 5, 1970, Ser. No. 43,740
Int. Cl. F25d *17/06*
U.S. Cl. 62—95 **10 Claims**

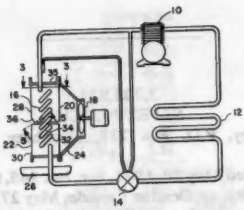


A dehumidification arrangement for air in a closed circulating system wherein the air is passed at a relatively high velocity over a first cooling coil having a surface area and temperature such as to cool the air to approximately the ultimate desired temperature and thence a portion only of the air is passed at a relatively low velocity past a second cooling coil at a temperature at or below the dew point temperature of the water vapor in the air. In one arrangement, the second cooling coil is baffled so that none of the air directly impinges thereon. A much greater amount of moisture is removed with a lower cooling load on the second coil.

3,703,815
DOUBLE FIN COOLING COIL WITH CONDENSATE DIRECTOR

Donald C. Welch, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Sept. 27, 1971, Ser. No. 183,880
Int. Cl. F25d *21/14*
U.S. Cl. 62—290 9 Claims

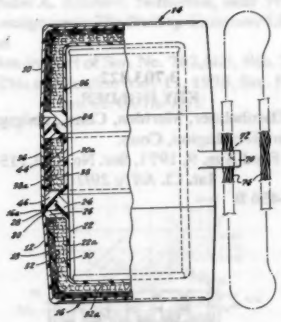


A compression cycle refrigeration system for cooling air is shown wherein the evaporator heat exchanger coil has two sets of fins, one set of fins being arranged above the other. The lower downstream corners of the fins of the upper set are folded over on the next adjacent fin to thereby form a series of condensate directors to cause condensate running down the downstream margins of the upper fins to transfer and adhere to the lower fins with reduced entrainment of condensate in the air passing over the heat exchange coil.

3,703,816
THERMO COLD-PAK CONTAINER

Robert E. Weathers, 11933 South Larrylyn Drive, Whittier, Calif.

Filed Oct. 15, 1971, Ser. No. 189,497
Int. Cl. F25d *3/08*
U.S. Cl. 62—457 3 Claims

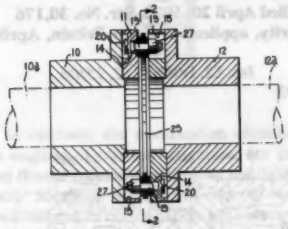


An outer container to maintain a liquid disposed in an inner container in a highly chilled condition for a prolonged period comprising a pair of cup-like shell combinations, each including an outer shell lined with styrafoam and an inner cup-like shell suspended from the rim of the outer shell to be inserted within the thus-lined outer shell, but spaced from lined walls. Such spacing is filled with semi-solid plastic jell, such as "blue ice". Each inner cup-like shell is mounted on the rim of its outer shell by an integral outwardly flaired annular portion, the edge of which interlocks with the rim area of the outer shell, thereby containing the plastic jell. The two shell combinations are then brought together with their respective cavities disposed in registry and means are provided to interlock the rims of the shell combinations. Such means may involve some type of mating threading on the two rims, the use of an interlocking adapter, or the use of an intermediate sleeve-like member having a similar wall structure to that of the two shell combinations with appropriate end means to be secured to and in registry with the rim of each shell combination. By use of the latter, the overall axial dimension of the container may be increased to accommodate larger sized liquid or filled inner containers, or otherwise to provide a larger capacity.

3,703,817
FLEXIBLE COUPLINGS

Olaf John Barclay Orwin, Birmingham, England, assignor to GIB Precision Limited, Gloucester, England

Filed Aug. 26, 1971, Ser. No. 175,297
Claims priority, application Great Britain, Aug. 26, 1970, 40,953/70
Int. Cl. F16d *8/00*
U.S. Cl. 64—13 5 Claims

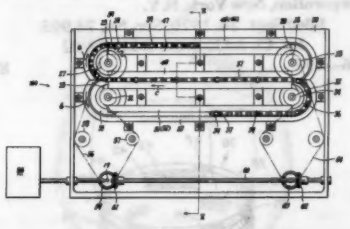


Flexible coupling, comprising a flexible torque transmitting member connected to a pair of rotatable coaxial drive members by bolts extending axially through peripherally coned bushes seating in correspondingly coned holes in the drive members.

3,703,818
APPARATUS FOR FEEDING WARPS OR FILLING THREADS TO KNITTING MACHINE

Shinobu Umeda; Yoshiaki Miyagawa; Yutaka Tanaka; Yukio Tanaka, and Ryoji Nakamura, all of Takatsuki, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Kita-ku, Osaka, Japan

Filed Dec. 21, 1970, Ser. No. 99,972
Claims priority, application Japan, Dec. 29, 1969, 45/1645; May 22, 1970, 45/43782
Int. Cl. D04b *23/06, 23/08, 23/10*
U.S. Cl. 66—84 R 7 Claims



A supply thread guiding apparatus has upper and lower tracks of equal length and each having a middle straight region common to the other one, a single flexible band means is provided which is not longer than the circumference of either of the tracks and which moves along the tracks. The band means has thread guides disposed therealong at fixed intervals. Means is also provided for guiding the flexible band means alternately onto the upper and lower tracks when the leading end of the flexible band means reaches the junction of the

upper and lower tracks at the end of the middle straight region. The beginning of the middle straight region is opposed to a first conveyor for carrying one of the respective ends of filling threads to one end of the knitting station of a knitting machine, and the end is opposed to a second conveyor for carrying the other ends of the filling threads to the other end of the knitting station. The arrangement is such that thread ends passed through the thread guides are delivered to thread clamps on the first conveyor at the beginning of the middle straight region and at the end thereof intermediate portions of the threads extending from the thread clamps on the first conveyor to the thread guides are delivered to thread clamps on the second conveyor.

3,703,819

CIRCULAR KNITTING MACHINES

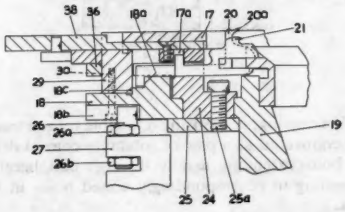
Keith Gerald Townsend, and David Arthur Harlow, both of Leicester, England, assignors to The Bentley Engineering Company Limited, Leicester, England

Filed April 20, 1970, Ser. No. 30,176

Claims priority, application Great Britain, April 26, 1969, 21,422/69

Int. Cl. D04b 9/12, 15/06

U.S. Cl. 66—93 **4 Claims**



A circular knitting machine having latch needles, sinkers and terry instruments is provided with a cam assembly having sinker operating cams and terry instrument cams mounted to permit relative adjustment between them to vary the relative timings of the sinker and terry instrument cams. In a machine having multiple knitting stations and sinker and terry instrument cams at the different stations, these are respectively on different cam plates which are relatively adjustable, with the sinker cams engaging butts which project the opposite way to the terry instrument butts.

3,703,820

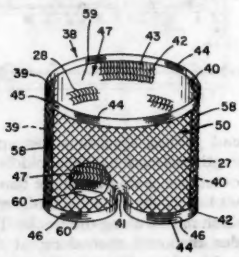
FOUNDATION GARMENT AND METHOD OF MAKING SAME

George E. Jackson, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 74,995

Int. Cl. A41b 9/02; D04b 23/02

U.S. Cl. 66—177 **8 Claims**



Foundation garments having a front panel of a different fabric construction than that of the rear panel are made in continuous web form on a double needle bar warp knitting machine, then cut from the web along transverse lines and inverted. One warp-knit, single fabric is power net with stretchable-retractive yarns extending wale-wise thereof to form a circumferentially stretchable rear panel in each garment. The other warp-knit, single fabric is in a simulated weave pattern and made of less stretchable warp yarns, to form a front restraint panel of woven appearance in each tubular garment, in which the "weft" portions extend axially.

3,703,821

SAFETY LOCK

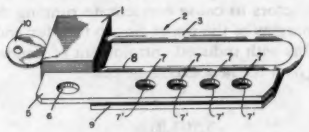
Albin E. Dorey, P.O. Box 727, Esterhazy, Saskatchewan, Canada

Filed May 20, 1971, Ser. No. 145,151

Claims priority, application Canada, May 27, 1970, 083,839

Int. Cl. E05b 67/22

U.S. Cl. 70—38 R **6 Claims**



The invention relates to a safety lock provided with a number of apertures capable of receiving individual workmen's padlocks and controlled by a master key so that the workman may work on a machine in the sure knowledge that the power cannot be switched on inadvertently by another workman.

3,703,822

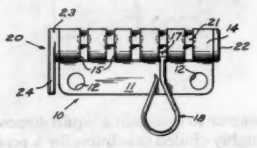
KEY HOLDER

Charles W. Elsenheimer, Meriden, Conn., assignor to Prentice Corporation, Kensington, Conn.

Filed Aug. 9, 1971, Ser. No. 170,115

Int. Cl. A47g 29/10

U.S. Cl. 70—456 B **4 Claims**



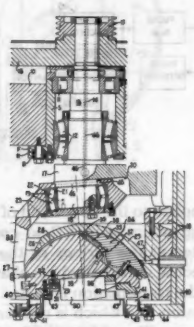
The key holder is provided with a cylindrical key hook retainer having a plurality of slots each formed to provide an aperture through which the head of a key hook may be inserted readily into the retainer, or withdrawn therefrom. Located within the retainer is a rotatable cylindrical closure also provided with slots each formed to provide an opening through which a key hook head may be inserted or withdrawn when it is aligned with an aperture of a slot in the key retainer. The closure is made of deformable material and the openings in the slots thereof are slightly smaller than the heads of the key hooks so that the latter must be forced therethrough.

3,703,823

UPSETTING OR FORGING MACHINES

Geoffrey Wilson, Denton, England, assignor to B. & S. Massey Limited

Filed July 1, 1970, Ser. No. 51,537
Claims priority, application Great Britain, July 3, 1969, 33,511/69
Int. Cl. B21j *13/02*
U.S. Cl. 72—406 14 Claims



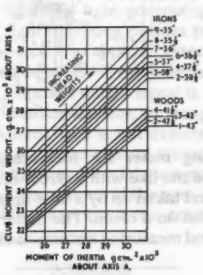
An upsetting or forging machine in which in a die set there is provided one die arranged to carry out a circular rocking motion about a point associated with the center of the die set, means being provided for adjusting the angularity of the axis of the rocking die in relation to the axis of the other die of the die set and a bearing means being provided to compensate for any changes in die dimensions due to heating and thus prevent seizing up of the dies.

3,703,824

APPARATUS FOR COMPARING MOMENTS OF INERTIA OF GOLF CLUBS

Denis A. N. Osborne, Liverpool; Robert C. Haines, Huddersfield, and John A. Kilshaw, Netherton, near Wakefield, all of England, assignors to The Dunlop Company Limited, London, England

Continuation-in-part of Ser. No. 702,668, Feb. 2, 1968, abandoned. This application May 11, 1970, Ser. No. 36,478
Int. Cl. G01m *1/12*
U.S. Cl. 73—65 4 Claims



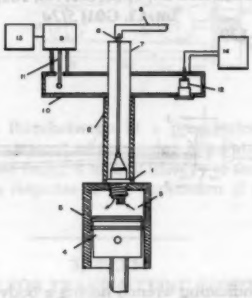
A set of golf clubs is provided which is balanced on the principle of common "moment of inertia" as opposed to the prior art sets which are balanced on the principle of common "moment of weight." The moment inertia about a given axis of any club in the set is no more than 5 percent, preferably 2 percent, particularly 1 percent greater than that of the club having the lowest moment of inertia in the set. Usually the said axis is one which passes horizontally through the top end of the shaft.

3,703,825

COMBUSTION MICROWAVE DIAGNOSTIC SYSTEM

Angelo Louis Merlo, 2115 East Long Lake Road, Troy, Mich.

Continuation-in-part of Ser. No. 764,566, Oct. 2, 1968, Pat. No. 3,589,177. This application April 27, 1971, Ser. No. 137,780
Int. Cl. G01m *15/00*
U.S. Cl. 73—116 7 Claims



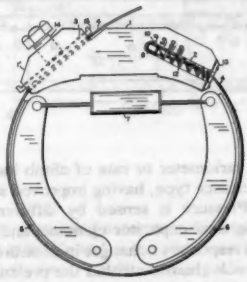
Methods to resonate the combustion chamber of internal combustion engines at radio frequencies, for the purpose of bottom dead center measurement at all available engine rpm are disclosed. Methods to employ the Q value of radio frequency resonances in combination with electron producing standard fuels for mechanical and electrical measurements within and near the combustion chamber, at all available rpm, are also disclosed. The basic system employed in the measurements comprises a turnable source of coherent radio frequency energy and a hybrid transmission line to convey the radio frequency energy into the combustion chamber. It is also used to detect the energy reflected back from the combustion chamber. The method for detecting bottom dead center requires changing the transmitted frequency so that a resonance occurs at precisely the maximum displacement of the piston during it's stroke. The method for determining the properties of materials requires a comparison between the Q value with standard electron producing fuel and the Q value of the ingredients in question.

3,703,826

BRAKE TESTING TOOL

Francis T. Burke, 590 Garnet Street, North Babylon, N.Y.

Filed Jan. 27, 1971, Ser. No. 110,120
Int. Cl. G01l *5/28*
U.S. Cl. 73—121 2 Claims



A steel band is adapted to be clamped on vehicle brake shoes when the brake drum has been removed for the purpose of testing the operation of the brakes. One end of the steel band is clamped with a clamp in a holding member, and the other end of the steel band is connected to the holding

member with a calibrated spring scale. If the band is clamped in place on the brake shoes, when the brakes operate, the force exerted by the shoes may be read on the scale.

3,703,827

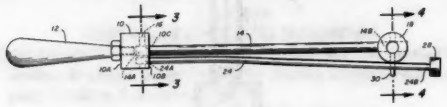
TORQUE WRENCH

Judson C. Cole, Tulsa, Okla., assignor to Continental Industries, Inc., Tulsa, Okla.

Filed Dec. 28, 1970, Ser. No. 101,972

Int. Cl. G01l *5/24*

U.S. Cl. 73—139 **3 Claims**



A torque indicating wrench having a body block, a handle affixed to the body block, a torque arm extending from the body block and having a socket affixed to the outer end for engaging a rotatable element, a rod affixed to the body block extending generally parallel to the torque arm, and a means at said socket for retaining the outer end of the rod in a ready position wherein the rod is flexed from its normal position and for releasing the rod from the ready position when the torque applied to the torque arm causes the outer end of the torque arm to deflect away from the rod a predetermined amount.

3,703,828

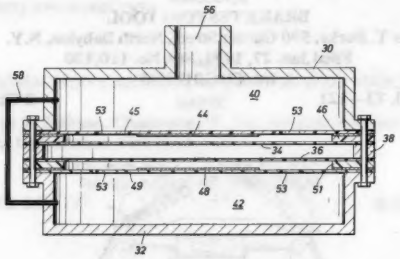
CAPACITANCE VARIOMETER

Edwin R. Bullard, Jr., and Wesley L. Joosten, both of El Paso, Tex., assignors to Globe Universal Sciences, Inc., El Paso, Tex.

Filed Nov. 5, 1969, Ser. No. 874,221

Int. Cl. G01c *21/00*

U.S. Cl. 73—179 **5 Claims**



An electronic variometer or rate of climb indicator of the diaphragm capacitance type, having improved sensitivity and response time. Pressure is sensed by differential pressure transducer having dual capacitor elements and a diaphragm which deflects in response to changes in pressure. A leak tube extends from a back chamber within the pressure transducer into an atmospheric chamber. The problem of non-linearity is overcome by the use of the dual capacitor elements which are connected in circuit to adjust the frequency of oscillation of a square-wave oscillator. The two channel output of the oscillator is passed through filter networks to eliminate the oscillation frequency and is then sent to a differential amplifier and displayed on a meter.

3,703,829

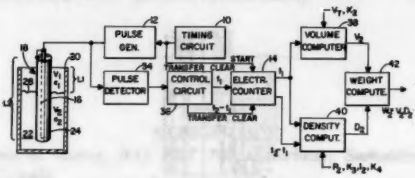
LIQUID QUANTITY GAGING SYSTEM

William R. Dougherty, St. Anthony Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed April 19, 1971, Ser. No. 135,096

Int. Cl. G01f *23/28*

U.S. Cl. 73—290 R **10 Claims**



Pulses are applied to the upper end of an electrical transmission line sensor mounted in a fluid container or tank. Each pulse is reflected at the surface of the fluid, because of the change in dielectric constant which changes the characteristic impedance of the transmission line, and again at the lower end of the transmission line which is not terminated in its characteristic impedance. The volume of fluid in the tank is a function of time delay, $t1$, associated with the surface-reflected pulse. The density of the fluid is a function of time delay $t1$ and another time delay, $t2-t1$, associated with the pulse reflected from the lower end of the transmission line and with respect to the surface-reflected pulse. The weight of fluid in the tank is the product of the volume and density functions.

3,703,830

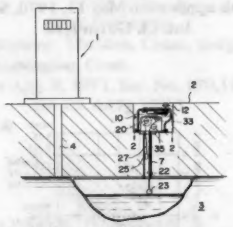
DIRECT-READING GASOLINE METER WITH BOB AND FLOAT CONTROL OF MEASURING TAPE

Sozaburo Maeshiba, 33-32, 4-chome, Hakataekimae, Fukuoka, Fukuoka Prefecture, Japan

Filed Sept. 11, 1970, Ser. No. 71,618

Int. Cl. G01f *23/08*

U.S. Cl. 73—321 **4 Claims**



A direct-reading meter for measuring the contents of gasoline tanks and the like with a direct-reading tape controllably payed out and taken up by a take-up spool under control of a bob suspended on a chain. The meter is used to convert existing stick or rod measuring systems to direct reading.

3,703,831

FLEXURE BEARING WITH LOW ROTATIONAL RESTRAINT

David J. Schauffler, Orange, N.J., assignor to The Bendix Corporation

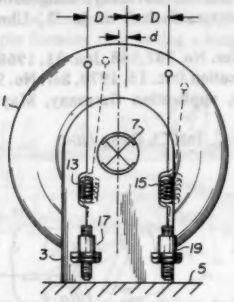
Filed Dec. 2, 1969, Ser. No. 881,347

Int. Cl. G01c *19/16*

U.S. Cl. 74—5 **9 Claims**

A bearing having flexure members for supporting an instrument and providing for limited rotation thereof. A plurality of spring members are arranged for exerting moments on the in-

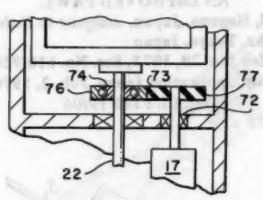
strument the sum of which provides an anti-restraining moment to oppose a restraining moment exerted thereon by the flexure members. Each spring member includes means for adjusting the spring force exerted thereby to make the restraining and anti-restraining moments substantially equal even at zero rotation.



3,703,832
ROTOR TILT

James M. Lindsey, Houston, and Thomas W. Stell, Fort Bend, both of Tex., assignors to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Filed May 18, 1970, Ser. No. 38,263
Int. Cl. G01c *19/30*
U.S. Cl. 74—5.45 7 Claims



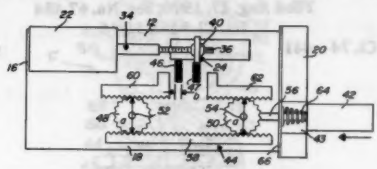
A system for controlling the tilt of a rotor on a gyro includes a sensing device on the rotor housing for detecting tilt, together with light generating devices mounted on opposite sides of the rotor housing and responsive to the tilt detecting device. Light sensors are mounted on the gyro housing and are responsive to light from the light generating devices on the rotor housing. The light detecting devices provide a control signal to a torqueing motor to apply a corrective force to the gyro system. The torque motor is continuously operated, and will rotate in a first direction until a signal is received from at least one of the light sensing devices, whereupon the direction of rotation reverses until light is not detected by one of the sensors. Use of light activated control system to transmit the error signal obviates the use of any friction-producing physical attachment with the components of the gyro in order to transmit such error signal to the torque motor control system.

3,703,833
DIFFERENTIAL MOTION MAGNIFYING MECHANISM

Emery E. Olah, Des Plaines, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 14, 1971, Ser. No. 143,507
Int. Cl. F16h *19/04*
U.S. Cl. 74—10.39 11 Claims

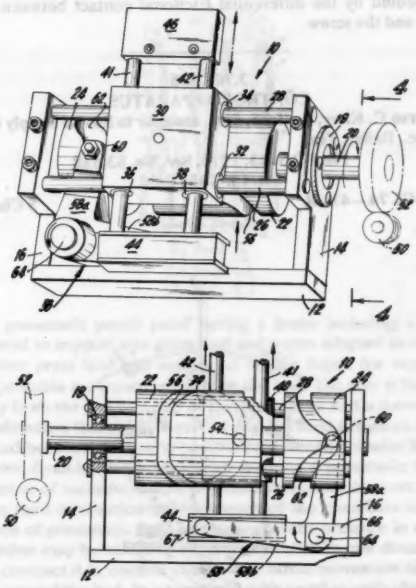
A pushbutton operated mechanism for adjusting the tuning apparatus of a pushbutton type radio receiver, includes a pair of gears, one of which is rotatably mounted on a fixed shaft and the other of which is rotatable on a shaft generally parallel to the shaft of the first gear and movable along a path toward and away therefrom. First and second racks, each engaging a gear, are separated from each other along a path. A pushbutton coupled to the movable gear, when depressed, causes the racks to be moved together along the path toward a fixed marker position therebetween at a preselected setting. A movable control element of the tuning apparatus, also positioned between the racks, is moved thereby to the preselected marker setting in response to the depression of the pushbutton.



3,703,834
DEVICE FOR TRANSMITTING CONTROL TRANSLATORY MOVEMENTS

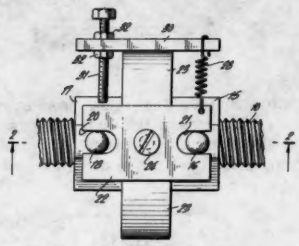
Earl F. Beezer, One Andrea Boulevard, Saddle Brook, N.J.

Filed Jan. 25, 1971, Ser. No. 109,229
Int. Cl. F16h *25/12*
U.S. Cl. 74—57 12 Claims



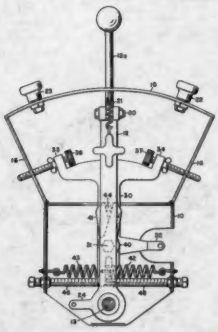
A device for transmitting accurate movements from a rotary input shaft to a movable end or top plate member or vice versa includes a longitudinal, (X-direction) guide for a movable block member which carries a follower which is engaged with a groove of a rotary cam and which also provides a slideway for a top plate or end plate member for movement in transverse (Y directions). The transverse movement is guided by a second cam mounted for rotation about the same axis as the first cam and which transmits the transverse movement to the transversely movable plate member through a rocker arm.

3,703,835
MEANS FOR TAKING UP SLACK IN LEAD SCREW DEVICES
Charles A. O'Connor, 100 Sunnyhill Drive, E. Norwich, and Richard J. Maehr, 4 Chelsea Place, Huntington, both of N.Y.
Filed Aug. 27, 1970, Ser. No. 67,484
Int. Cl. F16h *55/18*
U.S. Cl. 74—441 9 Claims



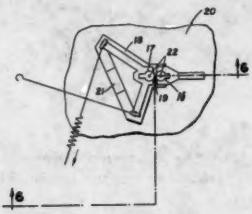
A spaced double nut combination mounted upon a lead screw and coupled to a movable table for reducing the nut backlash to zero. The two nuts are rotatably linked to each other by a spring loaded rockable yoke. The yoke acts to move the nuts to eliminate backlash on the lead screw. Binding action between the nut combination and the lead screw is prevented by the differential frictional contact between the nuts and the screw.

3,703,836
CONTROL APPARATUS
Warren C. Kiser, Bedford, Tex., assignor to Shovel Supply Co., Inc., Dallas, Tex.
Filed Oct. 23, 1970, Ser. No. 83,528
Int. Cl. G05g *9/08*
U.S. Cl. 74—471 R 5 Claims



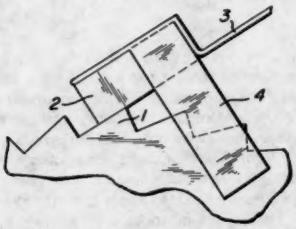
Disclosed is an apparatus for operating two control devices with a single hand operated lever. The hand lever is pivotally mounted for movement to forward and reverse positions from a neutral position to operate one control device directly. During a portion of its pivotal movement on either side of neutral it does not influence the second control device, but upon further displacement from neutral it engages a second lever pivotally mounted in coplanar relation with the hand lever to displace the second lever from its neutral position. The second lever is resiliently biased toward its neutral position so that it returns to it as the hand lever is moved toward its neutral position.

3,703,837
ARTICLE FOR USE IN SOUND RECORDING AND REPRODUCING INSTRUMENTS
Klaus Westphal, Berlin, Germany, assignor to Telefunken Patentyerwertungsgesellschaft m. b. H., Ulm/Donau, Germany
Continuation of Ser. No. 701,948, Jan. 31, 1968, abandoned. This application Dec. 15, 1970, Ser. No. 98,435
Claims priority, application Germany, May 10, 1967, T 33829
Int. Cl. G05g *1/04*
U.S. Cl. 74—519 4 Claims



An article of manufacture for use in sound recording and/or reproducing apparatus which is formed, by injection-molding, from a thermoplastic synthetic material. The article is formed into chassis and lever portions; the lever portions being pivotable with respect to the chassis portion about a pivot axis provided in a means connecting the lever portions to the chassis.

3,703,838
AN IMPROVED PAWL
Yuki Tsuruishi, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikasha, Tokyo, Japan
Filed Jan. 29, 1971, Ser. No. 110,958
Claims priority, application Japan, Feb. 2, 1970, 45/8571
Int. Cl. F16h *19/08*
U.S. Cl. 74—575 3 Claims

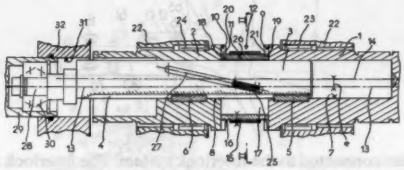


An arm holds a pallet jewel against a ratchet wheel which is thinner than the pallet jewel, and the arm is fitted with fingers which lie on either side of, but do not touch, the ratchet wheel. In case of mechanical shock to the system in a direction transverse to the ratchet wheel, the fingers come into contact with the face of the wheel and prevent disengagement of the jewel from the wheel.

3,703,839
VARIABLE-THROW CRANKPIN CRANKSHAFT
Auguste Velinde, Wicres, France, assignor to Verlinde S. A., Loos, France
Filed Feb. 9, 1971, Ser. No. 113,847
Claims priority, application France, Jan. 21, 1970, 7002073
Int. Cl. F16c *3/28*
U.S. Cl. 74—600 6 Claims

A crankshaft the crankpin consisting of a ring which has a throw variable from zero to several millimeters, and can transmit a relatively high torque value and withstand considerable

stress applied at variable angles without buckling while permitting any desired adjustment of the crankpin throw during the crankshaft operation. The crankshaft comprises to this end a two-section hollow shaft with an intermediate rod engaging the bores of the shaft sections and, between these sections, a crankpin forming ring having a longitudinal cavity of



elongated cross-sectional configuration and a width at least equal to the rod diameter and a major dimension at least equal to this diameter ; a diametral pin is locked to this ring by an outer sleeve which pin engages an oblique port formed in the rod whereby a change in the throw of the crankpin-forming ring is obtained by causing an axial movement of the rod.

3,703,840

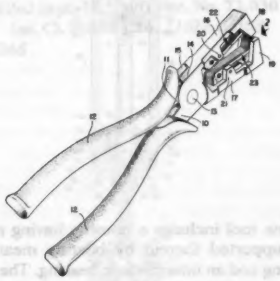
WIRE STRIPPER

Walter Kauf, 35 Kassel, AM Felsenkeller 26, Germany

Filed June 21, 1971, Ser. No. 154,906

Int. Cl. H02g *1/12*

U.S. Cl. 81—9.5 R **4 Claims**



A wire stripper having a pair of relatively movable jaws provided with a plurality of thin blade-like members mounted on spring arms so that they may flex, and move relative to one another when closed around a piece of metal such as a wire. The spring means is such that the blade-like members will sever any electrical insulation around such wire, but will not sever the wire.

3,703,841

ROTARY SHEAR FOR WRAPPING MACHINES

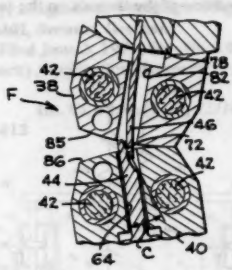
Donald C. Crawford, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 2, 1970, Ser. No. 7,718

Int. Cl. B26d *1/28*

U.S. Cl. 83—341 **6 Claims**

A wrapping machine cutting head of the rotary shear type wherein the lateral contact force between the shearing blades is effected by a camming surface, integral with one of the shearing blades, to laterally flex a resiliently flexible blade against a rigid blade as the two blades move into shearing rela-



tion with each other and with the web material intermediate two interconnected packages wrapped and sealed in the web.

3,703,842

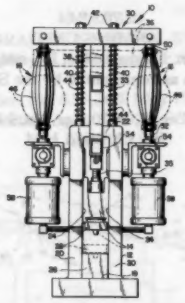
PNEUMATIC PRESS

John M. Yarlott, West Bare Hill Rd., and John C. Gray, Bolton Road, both of Harvard, Mass.

Filed Oct. 7, 1970, Ser. No. 78,683

Int. Cl. B16d *5/08*; B30b *1/32*

U.S. Cl. 83—524 **16 Claims**



A pneumatic punch press having a frame including a bed adapted to support one press tool and a ram adapted to carry another press tool and supported on the frame for vertical reciprocable movement relative to the bed. The ram is biased away from the bed by a pair of parallel springs and is moved in the direction thereof by a pair of parallel fluid actuators connected between the frame and the ram. Oeach actuator has a hollow, flexible, thin-walled shell defining a pneumatic fluid chamber of variable volume. A pneumatic control circuit provides fluid connection between each of the chambers and a source of pneumatic fluid pressure whereby pressure in each chamber may be varied to expand each shell in one direction and contract it in another direction to effect movement of the ram toward the bed. In accordance with another embodiment of the invention, a plurality of fluid actuators connected in series and end-to-end relation effect movement of a ram.

3,703,843

FASTENER WITH IMPROVED THREAD CONSTRUCTION

Richard C. Laverty, Schaumburg, Ill., assignor to MSL Industries, Inc.

Filed Jan. 4, 1971, Ser. No. 103,637

Int. Cl. F16b *25/00, 39/30*

U.S. Cl. 85—46 **4 Claims**

A fastener having a shank divided into first and second portions respectively located adjacent a head end and a tapered

pointed end with the first portion having a single thread formed thereon of uniform pitch. A multiple of parallel threads of similar uniform pitch are formed on the second portion of the shank and one of the threads on the second portion

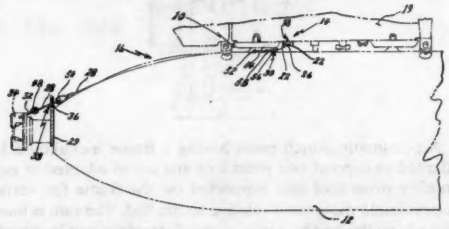
is a continuation of the thread on the first portion. All of the threads have a substantially uniform minor diameter while the major diameter of the upper single thread portion is greater than the major diameter of the lower multiple thread portion.

3,703,844

ARMING UNIT

Roy H. Bielkamp, Jr., Edwardsville, Ill., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 2, 1970, Ser. No. 94,348
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 D **5 Claims**



An arming unit which is capable of releasing in the armed or unarmed position a weapon. This arming unit is made up of an arming wire connected at one end to the weapon and at the other end to a locking member which is releasably secured to an aircraft. A uniquely designed spring loop and plate arrangement of the arming wire allows for arming of the weapon and then subsequent release of the arming wire along with the weapon from the locking member. If desired, however, the arming wire and locking member may also be released together with the weapon in the unarmed position.

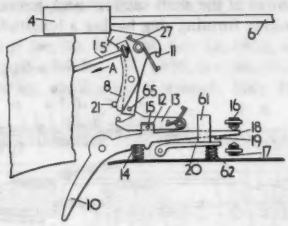
3,703,845

SMALL ARMS WEAPON AND SMALL ARMS RANGES

David Charles Lambert Griew, 45 Gloucester Road, Richmond, England

Filed July 17, 1970, Ser. No. 47,554
Int. Cl. F41j *1/20*
U.S. Cl. 89—134 **12 Claims**

A small arms range has at least one weapon, a target, and at least one transmitter which transmits a beam in the general direction of the or each weapon. The or each weapon has a receiver connected to an interlock system which prevents the weapon being fired unless the receiver is receiving a beam. The range is encircled by a guard beam the receiver of which



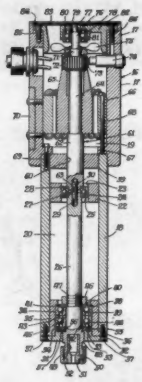
is also connected to the interlock system. The interlock system prevents the weapon being fired as soon as anyone enters the range.

3,703,846

MACHINE TOOL SPINDLE AND DRIVE

Lewis E. Krafft, 10 Gromer Road, Elgin, Ill.

Filed Nov. 16, 1970, Ser. No. 89,630
Int. Cl. B23c *1/00*
U.S. Cl. 90—11 A **20 Claims**



A machine tool includes a housing having a drive spindle rotatably supported therein by bearing means including a lower bearing and an intermediate bearing. The spindle is provided with a tool holder or chuck projecting outwardly at the housing and a labyrinth type seal cooperates with a removable cap to effectively seal the lower portion at the housing. An armature shaft is supported at its lower end on the intermediate bearing and is removably connected to said spindle by a threaded bore and stud arrangement to provide an effectively balanced shaft and spindle assembly. The armature is easily replaced and assembled through the upper end of the housing which has removably connected thereto a cap which supports a third bearing rotatably supporting the upper end of the armature shaft.

3,703,847

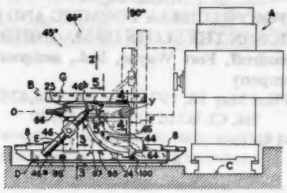
SUPPORT DEVICE FOR MACHINING WORKPIECES

Maurice Pillot, Etupes, and Louis Kilian, Montbeliard, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Billancourt, France

Filed July 28, 1970, Ser. No. 58,844
Claims priority, application France, Aug. 1, 1969, 6926560
Int. Cl. B23q *1/04*
U.S. Cl. 90—58 C **23 Claims**

Support device for machining workpieces comprising three parts, namely : a fixed bed, a saddle slidable on the bed in a first direction, a chassis pivotable on the saddle about a first

axis orthogonal to the first direction and a table rotatable on the chassis about a second axis orthogonal to the first axis. Means are provided for relatively moving the three parts. Locking means maintain the parts in given positions relative to each other. Weight compensating means are interposed



between the saddle and bed and between the table and chassis for compensating variations in the forces exerted by the workpiece on the bed and on the chassis in different regions, for example due to an overhanging position of the workpiece relative to the chassis or bed.

3,703,848

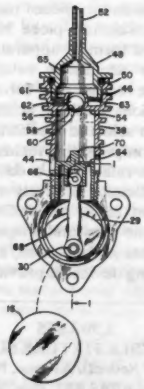
FLUID PRESSURE ENGINE

William L. Brown, 4th, P. O. Box 77, Pine Grove Mills, Pa.

Filed Sept. 14, 1970, Ser. No. 72,030

Int. Cl. F01l *15/14, 21/02, 31/08*

U.S. Cl. 91—265 **8 Claims**



This invention is an improved engine operated by gas under pressure having an improved valve guide, lubrication system, speed adjustment device, wrist pin, gas storage area, hollow crank shaft, and O-ring seal for the cylinder head. These improvements are positioned on a miniature engine capable of being used on tiny model airplanes, other power toys or the like.

3,703,849

MULTIPLE UNIT, HYDRAULIC ACTUATOR

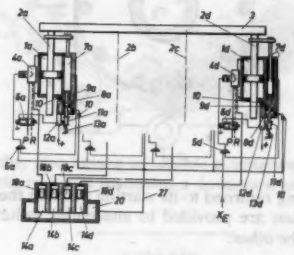
Eskhard Renner, Achim, and Udo Linnenbecker, Bremen, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed June 3, 1971, Ser. No. 149,614

Claims priority, application Germany, June 13, 1970, P 20 29 287.9

Int. Cl. F15b *11/16, 13/16*

U.S. Cl. 91—412 **18 Claims**



A multiple unit, hydraulic actuator system with servo feedback control of each unit and superimposed pressure balance control so that for each common input command pressure in all units is equalized to an average value.

3,703,850

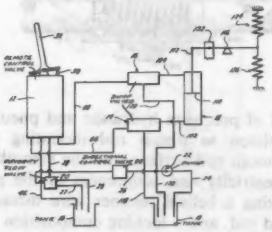
HYDRAULIC CONTROL SYSTEM

Don R. Honeycutt, Bryan, Tex., assignor to Redman Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 639,360, May 18, 1967, abandoned. This application April 3, 1970, Ser. No. 37,358

Int. Cl. F15b *9/08*

U.S. Cl. 91—446 **15 Claims**



The present invention relates to hydraulic control systems and in particular to a method and means for improving such systems used in remote control apparatus. The present invention utilizes dump valves positioned relatively close to the apparatus controlled by the hydraulic fluid for quickly removing from the system returning hydraulic fluid, thereby eliminating the problems that would develop in attempting to move this fluid back through a substantial length of the system and providing a faster response time.

3,703,851

HYDRAULIC ACTUATOR

Richard Joseph Ifield, and William Robert Ifield, both of Carters Road, Dural, Australia

Filed Dec. 23, 1970, Ser. No. 101,089

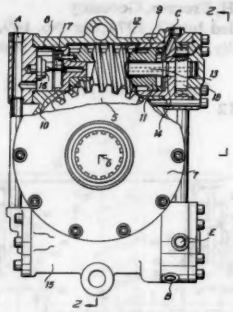
Claims priority, application Australia, Jan. 6, 1970, 0018

Int. Cl. F01b *3/00*

U.S. Cl. 92—33 **5 Claims**

A hydraulic actuator for producing translational movement over a long distance having two jack cylinders with pistons

mounted for reciprocal movement and connected to a worm wheel through a worm gear. When a piston is driving, the worm gear acts as a rack to turn the worm wheel and when a



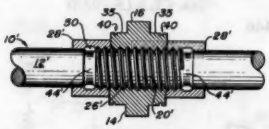
piston is being returned to its starting position the worm gear rotates. Means are provided to alternately switch from one cylinder to the other.

3,703,852

PISTON AND ROD ASSEMBLY FOR PISTON AND CYLINDER DEVICES

Morgan, Richard M., Chicago, Ill., assignor to Miller Fluid Power Corporation, Bensenville, Ill., a corporation of Illinois

Filed Aug. 13, 1970, Ser. No., 63,461
Int. Cl. F16j *1/12*
U.S. Cl. 92–258 **1 Claim**



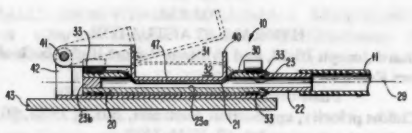
In the field of precision hydraulic and pneumatic power systems, a piston to piston rod mounting utilizing the cylindrical smooth rod surface and the smooth piston bore to hold concentricity and squareness of the piston to the rod and utilizing a helical retainer wire threaded between the piston and rod, and a locking composition to fasten the assembly in intended position.

3,703,853

COMPACT FLUID ACTUATOR AND METHOD OF MAKING IT

Donald J. Steger, Corinth, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,775
Int. Cl. F01b *19/00*
U.S. Cl. 92—92 **10 Claims**



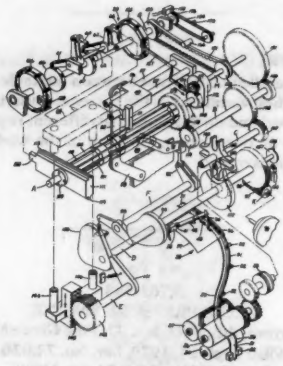
A compact fluid powered actuator is constructed from a flexible tube assembled over a rigid core. The actuator includes an expansible chamber formed between the tube and the core. The chamber is bounded by naturally efficient and lowly stressed seals at the ends of the tube which tightly match the periphery of the core. This construction lends itself to mass production methods wherein a long core is assembled with a long tube enabling a plurality of actuators to be manufactured simultaneously.

3,703,854

METHOD FOR PRECISELY FORMING AND PLACING INSULATION IN THE SLOTS OF MAGNETIC CORES

Leo M. Schlaudroff, Fort Wayne, Ind., assignor to General Electric Company

Filed May 18, 1971, Ser. No. 144,425
Int. Cl. B31d *5/02*; **B31f** *7/00*
U.S. Cl. 93—1 G **5 Claims**



Apparatus and method for accurately sizing pieces of insulation and for placing formed pieces of insulation into slots of a magnetic core. Dielectric strip material is fed to a sizing and forming station by a strip accumulating and urging device, and dielectric material pieces of preselected sizes are precisely formed. The core is precisely aligned relative to the forming member so that the insulation pieces may be inserted into a core slot which the insulation piece has been particularly formed to fit. Preferred form of apparatus includes constant force mechanisms for accurately returning strip material length determining, severing, and forming mechanisms to respective dwell positions; positive acting cams, e.g., conjugate and face cams, in selected mechanism drive trains; and positively controlled compensating means for selectively positioning a core support relative to a datum plane of the apparatus. Means in the form of relatively movable pressure bars are urged, by constant force mechanisms, toward forming devices having different sizes and shapes to form insulators there against. In another embodiment, a modified guide ring for forming and inserting devices is provided.

3,703,855

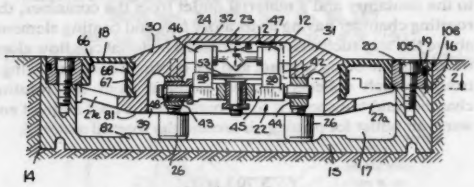
RECESSIBLE FIXTURE SUPPORT

Victor E. Converso, 77 Seventh Avenue, New York, N.Y.

Continuation of Ser. No. 785,482, Dec. 20, 1968, abandoned.
This application Dec. 27, 1971, Ser. No. 212,480
Int. Cl. E01c *23/16*
U.S. Cl. 94—1.5 **14 Claims**

A supporting receptacle is embedded with the annular rim flush with the embedding surface. A conically shaped lamp support is attached to a mounting ring secured to the rim or the receptacle by an annular resilient diaphragm and is normally positioned with the lamp and conical surfaces above the embedded rim and a body portion recessed within the receptacle. The body portion has radial extending means distributed

circumferentially around the lamp support for engaging the rim to conduct heat away from the lamp support and for engaging the receptacle to pivot the lamp support into a recessed position on the passing of a moving member.

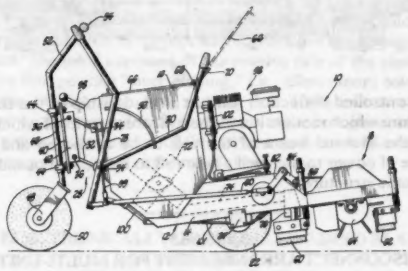


3,703,856

SEAL COATING MACHINE

David C. Wikel, Sandusky, and Rymer H. Smith, Burgoon, both of Ohio, assignors to Wikel Manufacturing Co., Inc., Sandusky, Ohio

Filed Jan. 22, 1971, Ser. No. 108,825
Int. Cl. E01c *19/12*
U.S. Cl. 94—44 **7 Claims**



An asphalt sealing machine for applying a sealer coating to asphalt paving or the like. The machine includes a body having a tank for storing fluid and a spreader means including two spaced scrapers and a rotary spreader to which fluid is dispensed from the tank. A pair of spaced wheels movably support the body and are connected to the body for rotation about an axis. A second or dirigible wheel is operatively connected to the tank by positioning means. The dirigible wheel is on one side of the axis of the first pair of support wheels and the spreader means is on the opposite side of the axis. The positioning means interconnecting the tank and the dirigible wheel include a pair of spaced parallel links and a lever arm connected thereto which may be pivoted to raise and lower the tank to thereby raise and lower the spreader means from a position engaging the surface over which the machine moves to a position spaced above the surface.

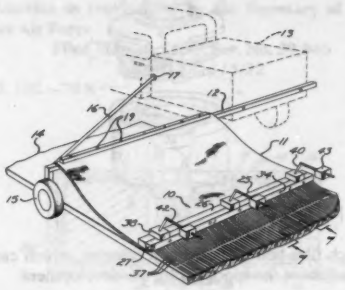
3,703,857

HIGHWAY SLOTTING DEVICE

Alan G. MacKinnon, Newcomerstown, Ohio, assignor to The W. M. Brode Company, Newcomerstown, Ohio

Filed July 2, 1971, Ser. No. 159,152
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 **15 Claims**

There is disclosed herein an elongated member disposed transversely of a lane of newly poured concrete and dragged forwardly lengthwise of the lane while in such transverse position, the elongated member having a multiplicity of closely spaced, parallel, flexible rods projecting rearwardly at a slight downward angle and pressing resiliently into the plastic concrete and progressively forming slots therein, the elongated member also having adjustable counterweights projecting above the rods and sustaining a downward pressure on the rods.

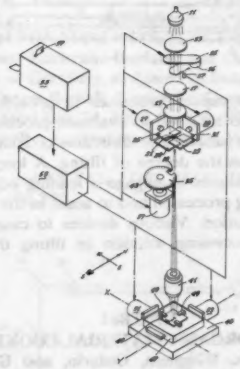


3,703,858

APPARATUS FOR PREPARING MASTER RETICLES

Peter S. La Canfora, Santa Barbara, Calif., assignor to Gyrex Corporation, Santa Barbara, Calif.

Filed Aug. 31, 1970, Ser. No. 68,182
Int. Cl. G03b *29/00*
U.S. Cl. 95—12 **4 Claims**



A pattern generator comprising a light source from which light rays are directed past a shutter and an adjustable optical slit for delivery to a precision reduction lens which exposes a high resolution photographic plate mounted on a movable mounting fixture. An alphanumeric disk is positioned between the optical slit and the reduction lens so that, if desired, a character or number may be imaged onto the photographic plate.

3,703,859

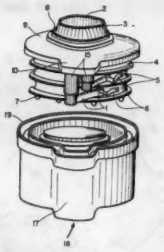
DAYLIGHT FILM DEVELOPING TANK

Mamoru Katsuragi, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed April 13, 1970, Ser. No. 27,849
Int. Cl. G03d *1/14*
U.S. Cl. 95—90.5 **5 Claims**

A daylight developing tank of roll films for simultaneously developing a plurality of comparatively short roll films. The tank includes a spool having a plurality of film-holding grooves, each of which grooves holds a film only at the upper

and lower edges thereof. Film retainers are secured to the film-holding grooves, respectively, for retaining the outermost



end of each film being loaded in a cassette, which cassette is disposed adjacent the spool during the development.

3,703,860

APPARATUS FOR PHOTOGRAPHIC PROCESSING

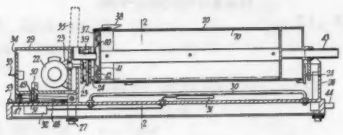
Peter R. S. Wilkinson, 2 Glade Close, Ditton Hill, Surbiton, Surrey, England

Filed May 26, 1970, Ser. No. 40,670

Claims priority, application Great Britain, June 4, 1969, 28,217/69

Int. Cl. G03d *3/08*

U.S. Cl. 95—93 **15 Claims**



A drum photographic processer is provided to rotate horizontally but to be tilted to evacuate processing solution while still being rotated. The direction of rotation may be changed as well as the degree of tilting. A longitudinal slot within the drum serves to engage a leading edge of photographic film being processed and to assist in the desired flow of processing solution. Various devices to cause automatic evacuation of processing solution or tilting the drum are described.

3,703,861

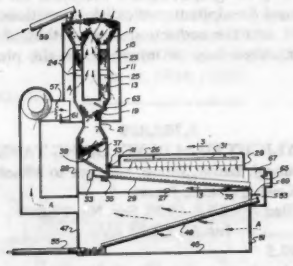
RAW ORGANIC MATERIAL COOKER

Vaughn H. Slack, Wingham, Ontario, and Gilliaan Peter Koens, Missisauga, Ontario, both of Canada, assignors to Farm Automatic Feeding Limited, Gorrie, Ontario, Canada

Filed June 25, 1971, Ser. No. 156,815

Int. Cl. A23k *1/00*

U.S. Cl. 99—443 **8 Claims**



An apparatus for heat treating particulated organic material consisting of a preheating chamber, a roasting chamber operatively connected to the heating chamber, and a cooling chamber operatively connected to the roasting chamber; the preheating chamber having a hot air inlet, a preheating container in communication with the hot air inlet, a material inlet to the container and a material outlet from the container; the roasting chamber having a vibratory tray and heating elements above the tray such that the preheated material can flow along the tray while being roasted; and the cooling chamber having a trough which collects roasted material from the roasting chamber and transports it to an outlet, and a cool air inlet and warm air outlet for passing air around the roasted material.

3,703,862

WORK PRESSURE ROLLING ASSEMBLY

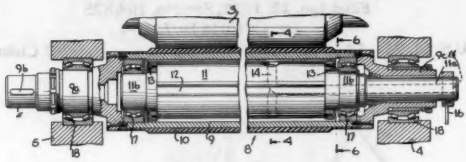
Valentin Appenzeller, Kempen/Niederrhein, Germany, assignor to Edward Kusters Maschinenfabrik, Krefeld, Germany

Continuation-in-part of Ser. No. 375,237, June 15, 1964. This application Oct. 21, 1966, Ser. No. 588,571

Claims priority, application Germany, June 25, 1963, K 50053

Int. Cl. B30b *3/04*

U.S. Cl. 100—162 B **7 Claims**



A controlled deflection roll has a relationship of the frame structure which mounts it and the roll structure itself which allows the internal beam of the roll to be anchored and the source of power to the shell of the roll to be located outside of the frame structure.

3,703,863

DISCONNECT ARRANGEMENT FOR MULTI-UNIT PRINTING PRESS

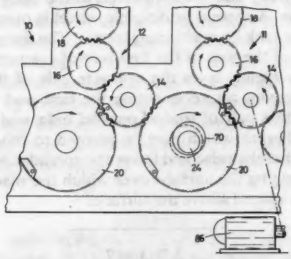
Pietro Giuluzza, Milan, Italy, assignor to O.M.C.S.A. Officine Meccaniche Cigardi S.p.A., Milan, Italy

Filed June 14, 1971, Ser. No. 152,852

Claims priority, application Italy, June 8, 1971, 25600 A/71

Int. Cl. B41f *7/04*, *21/04*

U.S. Cl. 101—183 **9 Claims**



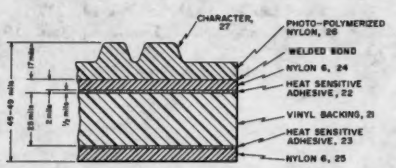
A disconnect arrangement for a multi-unit press in which the transfer cylinder is supported on eccentrics which, when actuated, bodily shift the axis of the transfer cylinder a distance sufficient to separate the transfer cylinder gear teeth from the teeth of an adjacent gear in the gear train and in which the normally stationary gripper cam for the transfer cylinder grippers is shifted with the transfer cylinder such that the cam maintains concentricity with the cylinder thereby avoiding damage to the grippers as the grippers are actuated by the cam when the cylinder is disconnected.

3,703,864

MICR IMPRINTING PHOTO-ETCHED CREDIT CARD

John Ramsey Bradford, Falmouth, Maine, assignor to Magnacheck Corporation, Marblehead, Mass.

Filed Nov. 2, 1970, Ser. No. 86,257
Int. Cl. B41l 47/02; G03c 5/00; G03f 7/00
U.S. Cl. 101—369 2 Claims



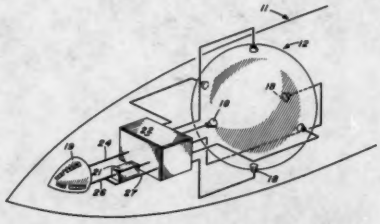
A personal credit card for use in a hand operated imprinter for placing MICR and OCR encoding on business documents through a suitable carbon comprises a balanced laminated structure of a PVC core having a light insensitive nylon film adhesively bonded on each side. A film of a photo-polymerizable nylon is autogeneously bonded to one of the light insensitive films. The reverse side of the photo-polymerizable film is lightly exposed prior to the autogeneous bonding. The obverse photosensitive side of the film is exposed through a negative containing the requisite visually readable and machine-readable types of characters, and the unexposed background areas are then removed by solvent washing to leave the characters in relief. The prior exposure of the reverse side of the photosensitive film permits "over etching," i.e., allows more tolerance in the etching step and assures that 100 percent contact between the two nylon films remains at the autogeneous bond minimizing penetration of the solvent to the sub film and assuring good support of the relief characters.

3,703,865

ELECTRONICALLY CONTROLLED AIMED BLAST WARHEAD

Warren L. Gilbertson; Everett T. Shelton, Jr., both of Fredericksburg, and Hobert M. Southall, King George, all of Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 28, 1968, Ser. No. 710,706
Int. Cl. F42b 1/00; F42d 1/04
U.S. Cl. 102—56 11 Claims



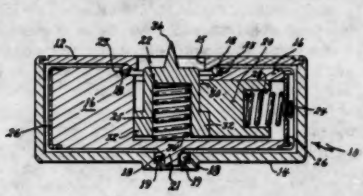
An aimable warhead comprising a spherical core of high explosive, a buffer material enveloping this sphere, sheet explosive enveloping the buffer and an outer casing for the entire warhead. The buffer material is such that initiation of the outer layer of explosive at a single location does not immediately initiate the core explosive. However, the collision of detonation waves in the sheet explosive produces enough additional pressure at the line of collision to initiate the core at that line. The selection of a plurality of initiation points and of a sequence of initiation enables the explosive force of the core to be directed in a desired direction.

3,703,866

DELAY ARMING MECHANISM

Eugene Semenza, Buffalo, Minn., assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed May 20, 1970, Ser. No. 39,946
Int. Cl. F42c 15/22
U.S. Cl. 102—70 S 6 Claims



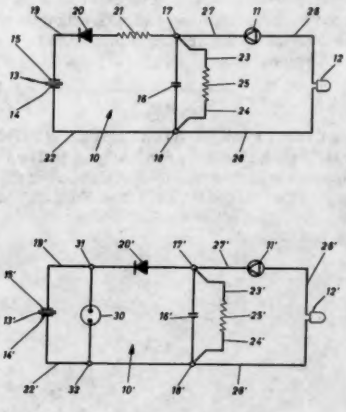
A delay arming mechanism having an outer housing and an inner housing rotatably mounted within the outer housing. A firing mechanism is also located within the inner housing and a plurality of lockweights prevent the movement of the firing mechanism. Upon spinning of the outer housing, the inner housing initially remains stationary due to its inertia. Eventually due to friction the inner housing also begins to spin. At a predetermined RPM the lockweights within the inner housing move out of engagement with the firing mechanism and allows for its movement into the actuating position. It is the time necessary for the inner housing to reach the speed of the outer housing which constitutes the delay time of this invention.

3,703,867

MINE DETONATOR WITH ELECTRIC IGNITION

Paul Madlener, Karlsruhe-Durlach, and Otto Pecksen, Herrenalb, both of Germany, assignors to Industrie-Werke Karlsruhe Aktiengesellschaft, Karlsruhe, Germany

Filed Dec. 24, 1968, Ser. No. 790,504
Claims priority, application Germany, Dec. 27, 1967, P 15 78 488.0
Int. Cl. F42c 11/02, 15/40, 19/06
U.S. Cl. 102—70.2 R 6 Claims



A detonator for a land mine used in tank warfare is provided with an ignition circuit in which the source of voltage for ignition of the primer capsule is formed by a piezo-crystal transmitter. The latter when subjected to impact impulse produces voltage impulses which are applied to a summation device for building up and ignition voltage of the required magnitude to cause an ignition of the primer capsule in the mine.

3,703,868

PROTECTIVE SURFACE COVERING HAVING HEAT AND MOISTURE RESISTANT PROPERTIES FOR CASELESS AMMUNITION

Edmund C. Braak, Landing, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 7, 1970, Ser. No. 53,009
Int. Cl. F42b *1/00, 5/18, 9/16*
U.S. Cl. 102—103 5 Claims

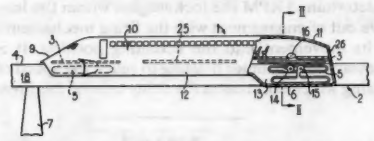
A heat and moisture resistant surface covering for propellant is provided. This surface covering is consumed in the chamber of a gun with the propellant charge being protected by the surface covering. The surface covering is prepared from a polyolefin film base material having a heat resistant and combustible composition bonded to the exterior surface of the base material. The surface covering of this invention has particular utility for use with caseless ammunition.

3,703,869

TRACK GUIDED VEHICLE

Richard Randell, Burwell, England, assignor to Tracked Hovercraft Limited, London, England

Filed July 28, 1970, Ser. No. 58,865
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 10 Claims



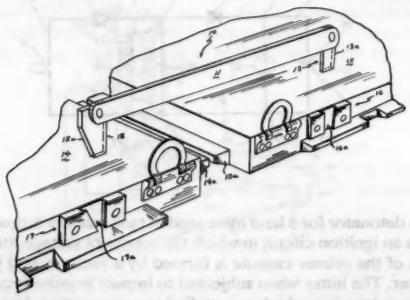
In a track guided gas cushion vehicle two longitudinally spaced pairs of cushion forming pads are provided on sides of the vehicle which embrace a rectangular-section track. The cushions of these pairs of pads co-operate with upper portions of the track sides to counteract lateral and yawing movements of the vehicle, due for example to cross winds. A further pair of cushion forming pads is provided on the vehicle sides, below the other pairs of pads, so that their cushions co-operate with lower portions of the track sides, and towards the vehicle rear, to counteract rolling moments exerted on the vehicle. Cushion forming pads to support the vehicle perform substantially no roll stabilizing function so as to be minimally perturbed by forces exerting yawing or rolling moments on the vehicle. Preferably the vehicle is propelled by a single sided linear induction motor.

3,703,870

COUPLER-CARGO PALLET/CONTAINER

Roger H. Walton, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed March 10, 1971, Ser. No. 122,706
Int. Cl. B60p *7/00*; B61g *5/00*
U.S. Cl. 105—366 R 3 Claims



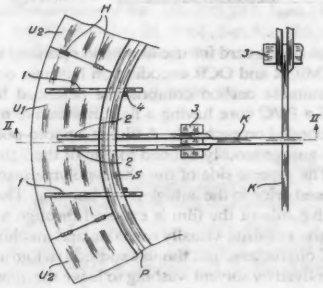
A cargo-pallet coupler mechanism for interconnecting and thereby joining a series of cargo-carrying pallets or containers in train, and consisting of a pair of elongated coupler-rods each having a depending key element on opposite sides thereof for respective engagement in a corresponding pair of block elements affixed on opposite sides of each pallet or container.

3,703,871

TABLE EXTENSION

Henry Filso Bertelsen, Industrivej 1, 6933 Kibaek, Denmark

Filed Jan. 18, 1971, Ser. No. 107,237
Claims priority, application Denmark, Jan. 19, 1970, 207/70
Int. Cl. A47b *1/05*
U.S. Cl. 108—66 4 Claims



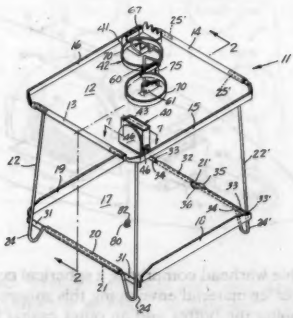
The leaf extensions are mounted on a set of short side extension bars and a set of long middle extension bars. The middle extension bars, when in the extended state, are restrained against pivoting by retaining slabs secured to the cross-frame. In order to permit the middle extension bars of diametrically opposed sets to slide over each other, the sets are provided with different profiles so as to slide on the retaining slabs into different planes.

3,703,872

COLLAPSIBLE PORTABLE UTILITY TRAY STAND

Domenick P. Barrevecchia, 12 Fernando Drive, Westerly, R.I.

Filed Feb. 26, 1971, Ser. No. 119,212
Int. Cl. A47b *3/08*
U.S. Cl. 108—111 8 Claims



A folding table consisting of a top board and a bottom shelf, with respective supporting leg assemblies hinged to opposite edges of the top board. One leg assembly has a cross bar to which one transverse edge of the bottom shelf is hinged, and the shelf has a resilient channel element on its other transverse edge lockingly receiving a cross bar on the other leg assembly.

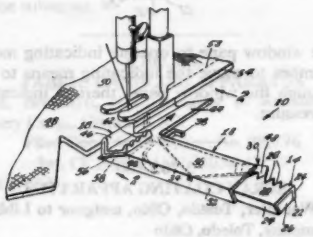
The channel element can be disengaged from its locking position and the shelf can be swung into an inverted overlying position covering the top board, with the leg assemblies swung to overlapping positions, closely received between the top board and the shelf. The top board is provided with various accessories foldable to positions close to the top board and covered by the shelf when the table is in its folded condition.

3,703,873

SELF-ADJUSTING SEWING MACHINE GAGE

Arthur Kalish, 64-10 Dieterle Crescent, Rego Park, N.Y.

Filed Sept. 26, 1966, Ser. No. 582,009
Int. Cl. D05b *35/10*
U.S. Cl. 112—153 **2 Claims**



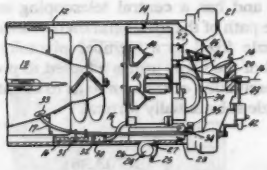
A gauge for positioning fabrics beneath a sewing machine needle and thus controlling the distance between a stitch and and edge of the fabric. Adjustment means for preventing the gage from obstructing the material feed by a possible protruding portion of the material are provided when an edge is configurated with acute angles. Automatic means for resetting the gage to a normal position, once the protruding obstruction of material has passed the gage is provided.

3,703,874

FLEXIBLE HOSE WIRE PAYOUT SYSTEM

Thomas H. Lemieux, N. Dartmouth, Mass., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 15, 1970, Ser. No. 55,122
Int. Cl. F42b *19/01, 19/06, 19/10*
U.S. Cl. 114—21 R **8 Claims**



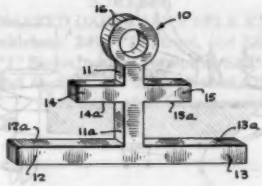
A flexible hose wire payout system is provided to protect guidance wires during the launch and guidance phases of wire-guided torpedoes. The entire flexible hose system is mounted in the torpedo tube so that when the torpedo is launched the hose is deployed and breaks away when it is entirely dispensed. After breaking away, the free end of the hose sinks to and remains at a position below the submarine, allowing the guidance wire thereafter to be dispensed through the hose and permitting considerably increased submarine maneuvering.

3,703,875

BOAT MOORING DEVICE

Robert N. Gunvalson, P.O. Box 78301, Lake Havasu City, Ariz.

Filed July 23, 1971, Ser. No. 165,627
Int. Cl. B63b *21/00*
U.S. Cl. 114—230 **6 Claims**



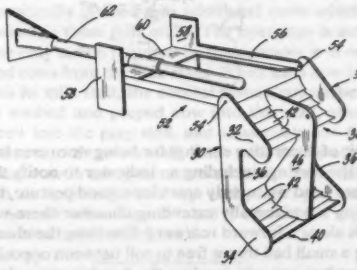
A mooring or anchoring device for boats which is designed to be detachably mounted on a boat pier whose walkway is formed of spaced planks comprising a body section having a ring to which a line from a boat can be tied and spaced laterally extending inner arm member and outer arm members which can be inserted between the spaced plaNks of the pier walkway and then rotated 90° till the arms extend transversely of the planks to prevent the device being accidentally disengaged from the pier.

3,703,876

TOWED UNDERWATER APPARATUS

Finn C. Michelsen, 1902 Independence Boulevard, Ann Arbor, Mich.

Filed Nov. 9, 1970, Ser. No. 87,981
Int. Cl. B63b *21/00*
U.S. Cl. 114—235 B **12 Claims**



Apparatus adapted to be towed underwater, or located in a moving water current, wherein a desired depth may be maintained consisting of a vertically oriented support upon which at least two vanes are horizontally disposed. The vanes are provided with foils or curved plates for producing a negative lift, and are vertically related with respect to each other. For large lift applications the vanes are formed by a plurality of slats between which the water may flow to prevent flow separation. The vane supports are preferably in the form of planar plates which orient the direction of movement of the apparatus and provide longitudinal stability, and towing bridle means are associated with the apparatus, preferably including a planar plate mounted upon the vane slats.

3,703,877

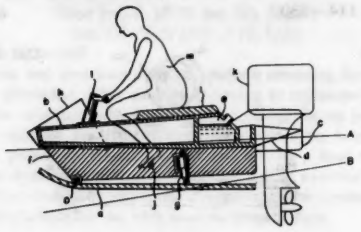
WATER SCOOTER

Akira Ueda, Ostermalmsvagen 31 D, 612 02 Finspong, Sweden

Filed June 19, 1970, Ser. No. 47,690
Claims priority, application Japan, Oct. 17, 1969, 44/98300
Int. Cl. B63b *35/00*
U.S. Cl. 115—70 **3 Claims**

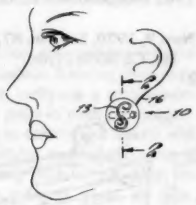
A water craft or scooter having an elongated, watertight and buoyant body or hull provided with a single ski or runner un-

derneath it and pivotally attached to it and also connected to it by shock-absorbing means. The body or hull is provided in its rear area with laterally extending wings, each of which carries at its outer end, a buoyant float. The wings and their attached



floats are easily detachable from the body or hull to thereby facilitate the transport and storage of the craft. The body or hull may be composed of fiber glass and it may contain a built-in fuel storage tank.

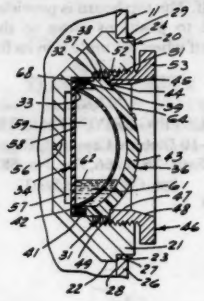
3,703,878
POSTURE EARRINGS
Peter Badovinac, 4069 Dille Avenue, Cleveland, Ohio
Filed July 26, 1971, Ser. No. 165,507
Int. Cl. G08b *3/00*
U.S. Cl. 116—67 **2 Claims**



A pair of decorative earrings for being worn on a ladies ears, one of the earrings including an indicator to notify the wearer when her head is properly erect for a good posture, this earing including a horizontally extending chamber there-within that extends along a forward rearward direction, the chamber containing a small ball that is free to roll between opposite ends of the chamber and which when the head is properly erect for good posture rests at the rear end of the chamber; and when the posture becomes careless by inclining the head forwardly causes the small ball to roll toward a forward end of the chamber thus giving a sharp clicking sound so to warn the wearer to hold her head erect, the other earring not incorporating the indicator.

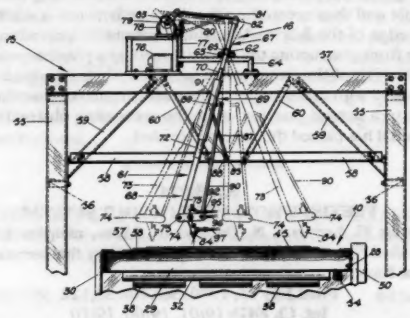
3,703,879
PRESSURE INDICATOR
Charles K. Huthsing, Jr., deceased, late of Old School Road, Libertyville, Ill. (N. Evelyn Huthsing, executrix)
Continuation of Ser. No. 828,468, May 28, 1969. This application April 6, 1971, Ser. No. 131,821
Int. Cl. G01l *19/12*
U.S. Cl. 116—70 **14 Claims**

A device for indicating pressure within a pressure vessel comprises a housing having a depression forming interior sidewalls and a bottom wall, window pane means closing an open end of the depression, an elastomeric diaphragm fitted within the housing depression and sealed between the window pane means and the bottom wall to define with the window pane a sealed chamber containing air to form air spring means urging the diaphragm away from the window. Passage-way means direct a pressure source to be measured to a side of the diaphragm opposite the air spring. Upon a sufficient increase in pressure of the source, the elastomeric diaphragm flexes



toward the window pane to operate indicating means in the sealed chamber to move the indicating means to a position visible through the window pane, thereby indicating an increase in pressure.

3,703,880
SPRAY COATING APPARATUS
David M. Wampler, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed May 6, 1970, Ser. No. 35,030
Int. Cl. B05c *5/00*
U.S. Cl. 118—2 **7 Claims**

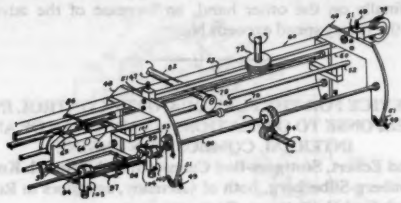


Apparatus for spraying a uniform layer of parting material on the surface of glass windshield blanks prior to the bending thereof in laminated pairs. A composite spray arm oscillates vertically about a pivot point above a continuous conveyor upon which the blanks are advanced while horizontally disposed, and has a central telescoping section adapted to render the path of the lower end thereof substantially linear. A spray nozzle fixed to a member pivotally mounted on the lower end of the spray arm is adapted to pivot in conjunction with the oscillation of the arm so as to maintain the axis of the spray nozzle substantially vertical.

3,703,881
APPARATUS FOR ULTRA-HIGH VACUUM IN SITU THIN FILM STUDIES
Franz X. Ruf, Kettering; Wayne R. Chase, Dayton, and Raymond A. Prell, Fairborn, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force
Filed May 13, 1971, Ser. No. 143,080
Int. Cl. C23c *13/08*
U.S. Cl. 118—9 **4 Claims**

A thin film fabricating and test apparatus has a substrate holder cart positioned on a pair of tracks within a tubular

vacuum system. Feed through drive units operate to move the cart to positions adjacent deposition units and test units within the vacuum system. A second drive unit positions the cart and



moves masks and test contacts to a position adjacent substrate. A third drive unit positions deposition control shutters adjacent the substrate.

3,703,882

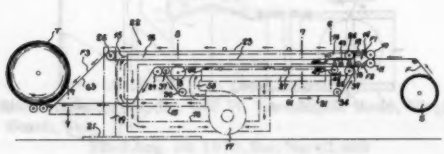
FABRIC HANDLING APPARATUS

Peter Haft, Brooklyn, N.Y., assignor to Knitting Specialty Machinery Corp., Glendale, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,776

Int. Cl. B05c *11/00*; D03d *47/50*

U.S. Cl. 118—32 **11 Claims**



A machine for converting a length of tubular fabric into an unfolded web of fabric including gumming, drying, slitting and opening the tubular fabric where the heat used in drying a gummed portion of the fabric is applied simultaneously along both the inside and outside surfaces of the gummed portion without the use of an internal spreader.

3,703,883

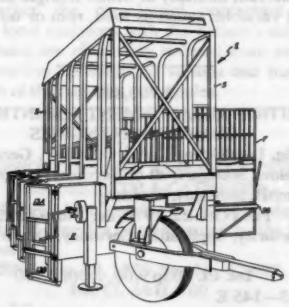
RETRACTABLE AUTOMATIC BREAKING DOOR FOR STARTING GATES

Richard M. Mills, Inglewood, Calif., assignor to Puett Electrical Starting Gate, Inc., Tuckahoe, N.Y.

Filed May 20, 1971, Ser. No. 145,247

Int. Cl. A63k *3/00, 3/02*

U.S. Cl. 119—15.5 **7 Claims**



A race track starting gate has a plurality of stalls each with front doors that simultaneously swing open during starting and rear breaking doors with lower portions that can be raised together. The rear doors of each stall are pivoted to the starting gate frame for opening to admit a horse and each rear door is provided with fenders to guide the horses and enclose same when the doors are closed. A common lifting device is connected to each lower door portions for lifting those portions off the ground at the same time.

3,703,884

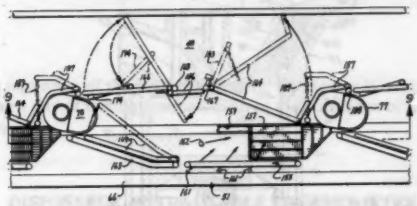
AUTOMATED DAIRY BARN MILK STALL

Richard E. Maddalena, 2494 "I" Street, and Edward J. Maddalena, 915 "I" Street, both of Petaluma, Calif.

Filed April 21, 1970, Ser. No. 30,470

Int. Cl. A01j *1/00*

U.S. Cl. 119—27 **4 Claims**



A dairy barn for automatically processing cows for milking. Individual cows are moved from a herd in a holding area serially into a wash stall, a prep stall; a runway, one of a plurality of milk stalls, and an exit passageway. The cows are moved from station-to-station automatically responsive to pre-set control functions and cow movement. Memory controls are provided to insure that every cow directed to a milk stall has gone through a complete wash and prep cycle. The memory controls are also designed to keep the milk stalls loaded with "unmilked" cows. For example, where cows are let out of two milk stalls in the same milking line, the wash and prep stalls will automatically process two additional cows which are in turn released to these milk stalls. The operation is automatic in that the only action required by the operator is in releasing the milked cows from the milk stalls. When each cow is milked and leaves its milk stall, the control system automatically advances a washed and preped cow into this stall, advances a washed cow into the prep stall, and advances a cow from the holding area into the wash stall. Each milk stall is adapted to position the cow in an optimum relationship for milking with respect to an operator's walkway, and pusher gates are provided to operate when the milk stall is opened for urging the cow to leave the milk stall by itself.

3,703,885

ROTARY PISTON INTERNAL COMBUSTION ENGINES

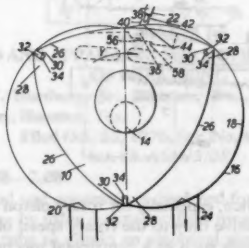
Fritz Feller, "Shaldon" 231 Manor Way, Crewe, England

Continuation-in-part of Ser. No. 807,263, March 14, 1969, abandoned. This application Nov. 6, 1970, Ser. No. 87,421

Claims priority, application Great Britain, March 29, 1968, 15,150/68

Int. Cl. F02b *55/14*

U.S. Cl. 123—8.11 **8 Claims**



A rotary piston engine of the Wankel type in which the combustion chambers are constituted by recesses positioned

in the leading half of each side of the piston and in which injection means is arranged to direct fuel into the recesses. The recesses are each provided with means so arranged that a rotational movement is imparted to the working fluid in a plane parallel to the base of the recess.

3,703,886

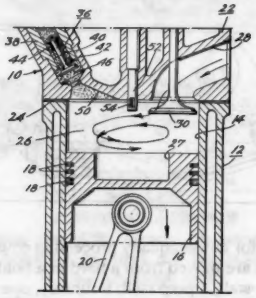
PUMPLESS STRATIFIED CHARGE GAS ENGINE

Julius E. Witzky, 121 Riviera Drive, San Antonio, Tex.

Filed Nov. 9, 1970, Ser. No. 87,753

Int. Cl. F02b 9/06; F02d 39/04

U.S. Cl. 123—32 ST **3 Claims**



A pumpless four cycle internal combustion engine for lighter-than-air gaseous fuels such as natural gas. The gas at a controlled low pressure is admitted to a gas chamber adjoining the engine combustion chamber by a check valve during the intake stroke while unthrottled air enters the combustion chamber and is given a swirling motion by suitable means at the air intake valve. During the compression stroke, the swirling air draws the gaseous fuel from the gas chamber and, due to the lower specific weight of the fuel, swirls the fuel spirally toward a centrally located glow plug. At the end of the compression stroke, the fuel charge is stratified around the glow plug in a concentric pattern whereupon ignition occurs.

3,703,887

IGNITION DEVICES FOR INTERNAL COMBUSTION ENGINES

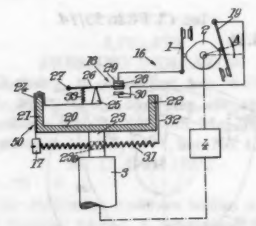
Jean Panhard, Paris, France, assignor to Societe de Constructions Mecaniques Panhard & Levassor, Paris, France

Filed Dec. 10, 1969, Ser. No. 883,945

Claims priority, application France, Dec. 12, 1968, 68177919

Int. Cl. F02p 5/04, 5/08

U.S. Cl. 123—117 R **1 Claim**



The ignition device, especially for rotary piston engines, includes means sensitive only to the rotary speed of the engine and modifying means such as a centripetal mechanism or an electromechanical mechanism. This modifying means ensures, on one hand, a substantially constant value of the ignition advance on starting and on slow-running speed of the engine, up to a speed N_L r.p.m., on the other hand a rapid reduction in the advance for rotary speeds of the engine comprised between N_L and the speed N_S, N_S being greater or equal to N_L and, finally on the other hand, an increase of the advance when the rotary speed exceeds N_S.

3,703,888

DEVICE FOR THE FUEL QUANTITY CONTROL IN RESPONSE TO OPERATIONAL VARIABLES OF AN INTERNAL COMBUSTION ENGINE

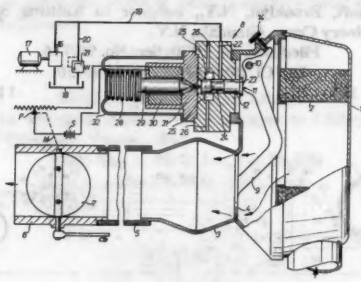
Konrad Eckert, Stuttgart-Bad Cannstatt, and Heinrich Knapp, Leonberg-Silberberg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

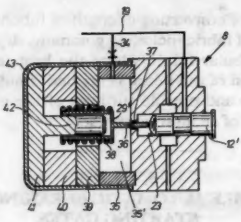
Filed Nov. 24, 1970, Ser. No. 92,345

Claims priority, application Germany, Dec. 1, 1969, P 19 60 146.8

Int. Cl. F02m 69/00, 63/02

U.S. Cl. 123—119 R **6 Claims**





In an internal combustion engine, a sensor, disposed in the suction tube and deflected as a function of the flow rate of air, operates a fuel quantity control member against a force which is derived from the magnetic flux of an electromagnet, the energizing current intensity of which changes as a function of operational variables (such as load, rpm or temperature) of the engine.

3,703,889

IGNITION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Bernd Bodig, Leinfelden; Gerhard Sohner, Geradstetten, and Gert Strelow, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 22, 1970, Ser. No. 83,039

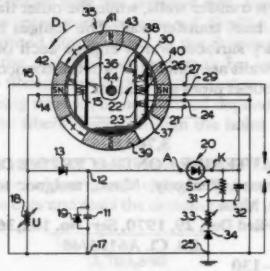
Claims priority, application Germany, Oct. 31, 1969, P 19 54 874.4

Int. Cl. F02p 9/00, 1/00, 77/00

U.S. Cl. 123—145 E **36 Claims**

Four rotating magnets, driven by the engine, induce in two or more windings a charging pulse, a discharging pulse, and a control pulse, the latter pulse in certain embodiments being identical with the charging pulse. The control pulse, the value

of which is engine rpm-dependent, causes a normally open circuit shunting the ignition capacitor to close when the engine rpm exceeds the permissible maximum, thereby discharging



the ignition capacitor and preventing it from furnishing electrical energy to the spark coil. In this way, the engine rpm is limited to safe values.

ERRATUM

For Class 126—85 B see:
Patent No. 3,703,895

3,703,890
SKIN PATCH TEST DEVICE

Milton A. Saunders, Jr., 440 W. Farmington Road, Virginia Beach, Va.

Filed Aug. 10, 1970, Ser. No. 62,480
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 W **12 Claims**

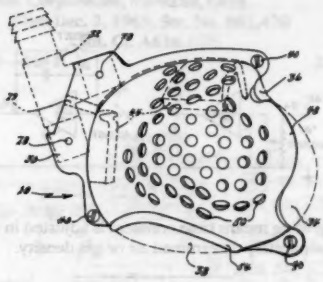
A plurality of individual applicators for performing skin patch tests are arrayed in spaced relation on an adhesively coated sheet of material for attachment to a patient's skin. A plurality of rupturable capsules or ampules are mounted with the adhesively coated sheet, each containing a different prepared test material or contactant, e.g. solid, particulate, etc., for contact with the subjects skin to enable a determination of whether the preselected contactant substances produce any local reactions with the patient's skin. The capsules or ampules are effectively isolated from each other to prevent interaction between the various test materials contained in each of the capsules or ampules.

3,703,891
MULTI-PURPOSE HELMET ASSEMBLY ESPECIALLY FOR USE WITH A CATHETER

William H. Talley, Alamogordo, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 28, 1970, Ser. No. 67,827
Int. Cl. A61f *5/00*
U.S. Cl. 128—2 R **5 Claims**

A helmet assembly having a helmet, a storage well and a connector assembly. The helmet has a pair of eye slots therein and a face and neck opening. The connector assembly is utilized for introducing the proper medical equipment, or the like, through the helmet to the wearer. By the proper sizing

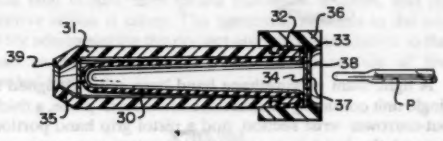


and mounting of the helmet assembly, the wearer is unable to disturb any of this equipment, even in the conscious or active state.

3,703,892
DISPOSABLE, RETRACTABLE THERMOMETER JACKET

Edward F. Meyers, 790 Boylston Street, Boston, Mass.

Filed Dec. 9, 1970, Ser. No. 96,605
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 H **8 Claims**



A prophylactic device comprising disposable, flexible, stretchable sterile jacket or sheath housed in a small, membrane sealed, tubular plastic or paper cartridge is disclosed herein. The sterile jacket may be very quickly stretched over and removed from a fever thermometer, thereby completely eliminating the need to otherwise conventionally sterilize thermometers or similar probes prior to each use. After its use, the jacket retracts automatically and sanitarily into the cartridge for easy disposal. The new prophylactic device simplifies and greatly reduces the cost of using all types of thermometer probes which require sterilization prior to each use. Large supplies of the cartridges may be packaged and stored for convenience in dispensers. Individual cartridges are small enough to be carried in large numbers in clothing pockets.

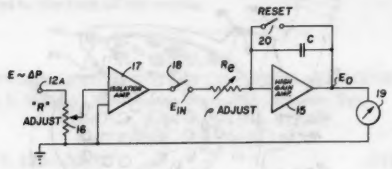
3,703,893
METHOD AND APPARATUS FOR DETERMINING WORK OF BREATHING

Edward V. Hardway, Jr., Houston, Tex., assignor to Spearhead, Inc., Houston, Tex.

Filed Oct. 23, 1970, Ser. No. 83,420
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **6 Claims**

A method and apparatus is disclosed for determining work of breathing by using a dynamic flow measuring means, such as venturi tube to obtain an electrical signal proportional to flow squared of air or other gas breathed. This signal is scaled in proportion to a previously obtained value of respiratory re-

sistance and then integrated over one or more respiratory cycles to obtain a signal proportional to the work of breathing.



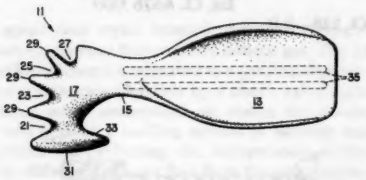
The integrating means time constant is adjusted in accordance with the separately determined air or gas density.

3,703,894

RIGID FOAM POLYURETHANE HAND SPLINT

Dwight V. Galloway, West Billings, Mont.; Gordon E. King, Moraga, Calif.; Charles C. Asbelle, Oakland, Calif., and Michael F. Arrigo, Berkeley, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 16, 1971, Ser. No. 115,458
Int. Cl. A61f 5/10
U.S. Cl. 128—77 5 Claims



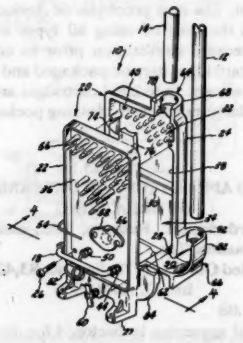
A light foam polyurethane hand burn splint designed as a single unit consisting of a broad, concave arm-piece, a thicker-but-narrower wrist section, and a pistol grip hand portion to support the hand in a position to prevent scar contractures from causing postburn deformities.

3,703,895

HEATING APPARATUS

Edwin E. Wiberg, 17594 Westbrook, Detroit, Mich.

Filed Dec. 3, 1970, Ser. No. 94,920
Int. Cl. F24c 3/00
U.S. Cl. 126—85 B 3 Claims



A heating apparatus having a housing enclosing a heat chamber between a pair of separable heat radiating walls and including an inlet boss adapted to be connected to an inlet pipe for conducting fresh air into the heat chamber, and an outlet boss adapted to be connected to an outlet pipe for conducting exhaust gas from the heat chamber. Each boss comprises separable flanges, one of which is integrally formed on one of the heat transfer walls, while the other flange is formed on the other heat transfer wall. The flanges have opposing complementary surfaces which engage each other when the heat transfer walls are joined to form the connections in which the inlet and outlet pipes are seated.

3,703,896

INTRAUTERINE CONTRACEPTIVE DEVICE

Elie S. Nuwayser, Peabody, Mass., assignor to Abcor, Inc., Cambridge, Mass.

Filed Dec. 29, 1970, Ser. No. 102,363
Int. Cl. A61f 5/46
U.S. Cl. 128—130 22 Claims

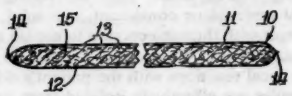
A three-dimensional intrauterine contraceptive device which conforms in an infinite manner to the internal geometric shape of the uterine cavity. The device is comprised of a plurality of resilient interconnected rib-like members which define a generally cylindrical-type shape. The device is inserted into the uterine cavity in a compressed condition. Upon release from a holder the device expands outwardly engaging the walls of the uterine cavity to provide an effective contraceptive device.

3,703,897

HYDROPHOBIC NON-ADHERENT WOUND DRESSING

Robert J. Mack, and John L. Fischer, both of Arlington Heights, Ill., assignors to The kendall Company, Walpole, Mass.

Filed Oct. 9, 1969, Ser. No. 864,989
Int. Cl. A61l 15/01
U.S. Cl. 128—156 13 Claims



A resilient, substantially flat, non-adherent flexible wound dressing which remains flexible when dry, of hydrophobic material capable of retaining substantial quantities of fluid wound exudate. One or both major surfaces may be non-adherent wound-contacting surfaces which may include fenestrated film or interrupted exposed portions of flattened sheet-like fused fibers having a filmlike appearance, or both. The interior of hydrophobic fibers is arranged to retain fluid wound exudate by capillary action. If superimposed fenestrated film is used, it may be united to the hydrophobic fibers either at or inside the dressing edges, or both, preferably by melt sealing.

Dressings may be prepared by pressing (with substantially no relative movement) the hydrophobic fibrous material, preferably a carded or air laid batt together with any fenestrated film between closely adjacent parallel uni-directionally

moving surfaces of a foam and a stainless steel belt which is heated and then cooled. In the absence of a covering fenestrated film, the surface fibers of the batt, pressed against the heated belt, are softened, flattened, fused and subsequently congealed in contact with the polished belt, thereby forming sheetlike interrupted surface areas of filmlike appearance. When a fenestrated film is added to the dressing, it passes in contact with the stainless belt and may be melt sealed in passage to the fibrous batt with sheetlike interrupted areas of fused fibers being formed, or not formed depending upon the temperature the fibers reach, through the holes in the fenestrated film.

A melt edge version of the dressing with soft edges may be made with a cooled perimeter clamp adjacent which a hot perimeter knife cuts and seals the dressing edge.

3,703,898
TEAT DILATOR

Eli A. Zackheim, Norwich, Conn., assignor to Jules Silver, Norwich, Conn.

Filed July 27, 1970, Ser. No. 58,569
Int. Cl. A61m *35/00*
U.S. Cl. 128—261 **5 Claims**

A teat dilator for insertion into the canal opening in a cow's teat and characterized by a multi-sided frame of more than two members joined together; the frame providing a cavity which may be used for carrying a medicament into the canal and the members forming the frame being made of resilient plastic material so that the dilator will deform on insertion into the opening but expand again after passing through the opening to support and separate the canal walls, the dilator being adaptable to fit into and be useful with canals of varying length.

3,703,899
SURGICAL DRAINAGE INSTRUMENT

Teodora A. Calinog, 320 E. North Avenue, Pittsburgh, Pa.

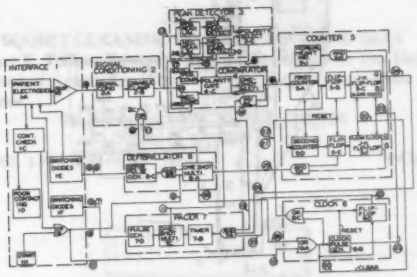
Filed Jan. 28, 1971, Ser. No. 110,469
Int. Cl. A61b *17/34, 27/00*
U.S. Cl. 128—347 **4 Claims**

A trocar is slidably mounted in a main tube and normally is disposed at its front end. Connected to the rear end of the trocar is a rod that extends back through the tube and out of its rear end. A tubular bellows encircles the rod and has a front end sealed to the trocar, while the rear end of the bellows is sealingly connected to the rear end of the tube. After the tube is inserted in an incision the trocar is pulled back into a position near the rear end of the tube. Directly in front of this rear portion the tube is provided with a lateral outlet opening and a discharge tube so that drainage can occur back through the two tubes.

3,703,900
CARDIAC RESUSCITATOR

Melvin A. Holznagel, Sherwood, Oreg., assignor to Cardiac Resuscitator Corporation, Portland, Oreg.

Filed Dec. 2, 1969, Ser. No. 881,470
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **22 Claims**



A resuscitator apparatus includes means for detecting and counting the heart beat of a suspected heart attack victim, and means for substantially immediately applying a pacing pulse or a defibrillating pulse, as required. Thus, if the patient's pulse rate is extremely low or nonexistent, a pacing pulse is automatically applied for stimulating a heart beat in time with such pulse. However, if the electrocardiac signal from the patient indicates an extremely high rate indicative of ventricular fibrillation, a defibrillating pulse is applied to the patient. If a normal beat occurs, appropriate indication is given, and no corrective action is taken. The apparatus attaches to the patient for administering the correct electrical stimulation to the patient as soon as possible after the occurrence of the suspected attack.

3,703,901
TOBACCO COMPOSITION

Vello Norman, Chapel Hill; Thomas B. Williams, Durham; Andrew G. Kallianos, Durham, and James D. Mold, Durham, all of N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 749,324, Aug. 1, 1968, Pat. No. 3,572,348. This application March 11, 1971, Ser. No. 123,422
Int. Cl. A24b *15/02*
U.S. Cl. 131—17 R **12 Claims**

A smoking preparation comprising tobacco and a zeolite material which effects a decrease in the amount of polycyclic aromatic compounds produced from the pyrolytic reactions of tobacco, the zeolite material being of the Y-type structure, at least partially exchanged with zinc ions and containing platinum or silver.

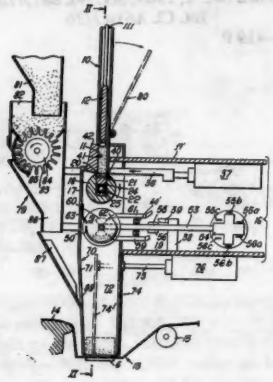
3,703,902
APPARATUS FOR MAKING CIGAR BUNCHES

John Adolph Sargrove, Weybridge, Surrey, England, assignor to The Imperial Tobacco Company Limited

Filed Feb. 17, 1969, Ser. No. 799,790
Claims priority, application Great Britain, March 6, 1968, 10,772/68
Int. Cl. A24c *01/02;* **G01g** *13/04*
U.S. Cl. 131—22 A **6 Claims**

An apparatus for making cigar bunches including means for preparing charges of filler tobacco which fall short of the tar-

get weight, means for determining how short the charges are, and means for adding a number of topping up units of tobacco

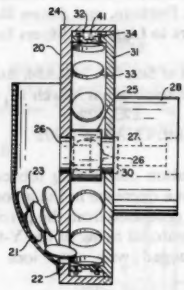


of predetermined size according to the amount by which the charge is short of the target weight.

3,703,903
ROTARY DRUM COIN STACKING AND DISPENSING DEVICE

Donald E. Landis; Mohanjit S. Sidhu, and Richard E. Cone, all of Cambridge, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Sept. 7, 1971, Ser. No. 178,320
Int. Cl. G07d 9/06
U.S. Cl. 133—1 **10 Claims**

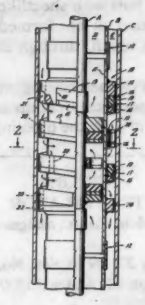


A coin dispensing mechanism comprising a plurality of coin dispensing stations, each station including a rotary drum having a circumferential flanged edge containing a plurality of holes mounted within a stationary wheel having a circumferential overhanging portion which forms a circumferential slot with the flanged edge of the rotary drum. The drum will rotate through a reservoir of coins during which coins will drop through the holes and into the circumferential slot. The coins will then be engaged by pins mounted on the outside of the flanged edge of the drum and transported through the circumferential slot until they come in contact with a coin chute located at the top of the drum into which they are deposited. When the coin chute is full, the drum will stop.

3,703,904
SAFETY PACK-OFF FOR WELLS

John McClinton, 8603 Glenaire, Houston, Tex.

Filed Sept. 7, 1971, Ser. No. 178,068
Int. Cl. F16k 31/00
U.S. Cl. 137—504 **4 Claims**

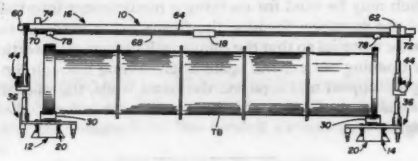


A safety pack-off operable to seal off the annular spaces between concentric pipe strings in oil and gas wells automatically in response to excessive fluid flows upwardly through the annular spaces.

3,703,905
HEAT EXCHANGER CLEANING SYSTEM

Charles O. Ice, Jr., Long Beach, Calif., assignor to Hydro-Vel Services, Inc., Monahans, Tex.

Filed June 26, 1970, Ser. No. 50,067
Int. Cl. B08b 3/02, 9/02
U.S. Cl. 134—144 **21 Claims**



A heat exchanger cleaning system includes a pair of dollies each comprising powered rollers for receiving and supporting a tube bundle and a boom pivoting assembly. A boom is supported on the pivoting assemblies for rotation about a tube bundle, and in turn supports a cleaning head that discharges cleaning material. In the use of the cleaning system, the distance between the dollies, the horizontal positions of the pivoting assemblies, the vertical position of the axis of rotation of the boom, and the distance from the axis to the boom are adjusted in accordance with a particular tube bundle configuration. Then, a tube bundle is mounted on rollers, the boom is rotated to successive positions arcuately of the tube bundle, and the cleaning head is moved back and forth along the boom. During its movement from position to position, the boom is pivoted about an axis extending longitudinally through it to optimize the angle at which cleaning material is discharged from the cleaning head.

ERRATUM

For Class 137—504 see:
Patent No. 3,703,904

3,703,906

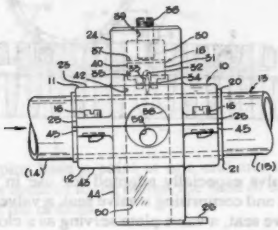
PIPE FITTING

Edward F. Tickett, El Paso, Tex., assignor to Alex B. Reynolds, St. Louis, Mo., a part interest

Continuation-in-part of Ser. No. 864,739, Oct. 8, 1965, abandoned, and a continuation-in-part of Ser. No. 54,398, Aug. 13, 1970, Pat. No. 3,652,107. This application March 5, 1971, Ser. No. 121,299

Int. Cl. F16e *41/04;* B23b *41/08*

U.S. Cl. 137—15 22 Claims



The pipe fitting is formed from a pair of coupling halves which are fastened together about a continuous pipe. One of the coupling halves includes a built-in cutter assembly capable of severing the pipeline into sections which are subsequently coupled together by the coupling halves. The other coupling half includes a valve compartment which receives a valve element insert-ed between the separated pipe sections. The valve may be adjusted to permit flow between the pipe sections; to divert flow to a branch line; and to cut off flow through the valve entirely. The pipe fitting is insulated from the pipe sections by liners and includes a fluid seal to preclude the escape of fluid from the pipeline following separation of the pipe into sections.

3,703,907

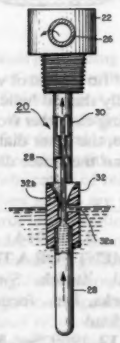
FLUID AMPLIFIERS

George B. Richards, 1212 Ranch Road, Lake Forest, Ill.

Continuation-in-part of Ser. No. 840,119, June 19, 1969, which is a continuation-in-part of Ser. No. 724,385, April 26, 1968, abandoned. This application Oct. 30, 1970, Ser. No. 85,637

Int. Cl. F15c *1/18*

U.S. Cl. 137—81.5 27 Claims



A fluid amplifier includes an inlet for directing a laminar fluid power stream along a predetermined axis. A control means downstream of the inlet includes a wall spaced laterally outward of the power stream and at least partially enclosing same with a guide surface portion of the wall curving outwardly away from the predetermined axis. An access opening to the power stream in the wall of the control means permits introduction of a perturbant signal to thereby alter the power stream from a laminar to a substantially turbulent flow pattern of a significantly greater cross-sectional dimension. This transition results in formation of a low pressure condition between the stream and the guide surface of the wall causing the stream to attach to the guide surface and divert away from the predetermined axis. Several embodiments and further features are disclosed.

3,703,908

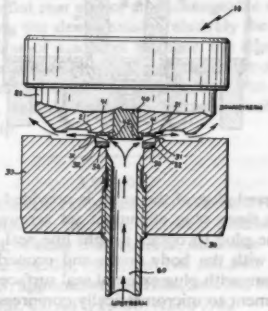
SQUIRT CLEANING POPPET VALVE AND SEAT

Gilbert F. Tellier, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 26, 1971, Ser. No. 166,136

Int. Cl. F16k *1/36*

U.S. Cl. 137—238 1 Claim



A poppet valve and seat, in a particle-entrained fluid flow system, which at closure cause a squirt which, by flushing action, prevents particles from remaining on the sealing interfaces of the poppet valve and of the seat.

3,703,909

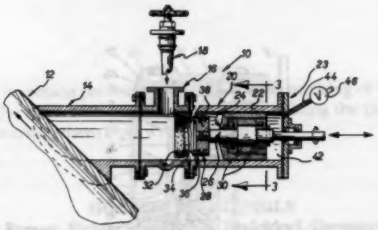
DRILLING APPARATUS

Brian Richard Erb, Montreal, Quebec, Canada, assignor to Hurtsteel Products Ltd., Montreal East, Quebec, Canada

Filed July 14, 1971, Ser. No. 162,569

Int. Cl. F16e *41/04;* B23b *41/08*

U.S. Cl. 137—318 12 Claims



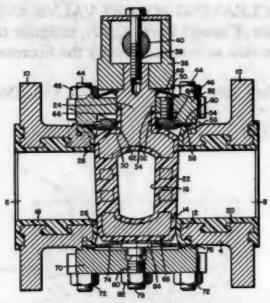
The disclosure herein describes a drilling apparatus for tapping fluid-conveying pipes under high internal pressure and temperature. The apparatus consists of a tubular housing in which a piston supporting a core drill shaft is axially displaceable. The shaft is rotated by an air driven motor and the piston is moved under the action of a working fluid fed into the housing through appropriate hydraulic conduits. The fluid is maintained under a predetermined positive pressure to provide the core drill with a constant cutting feed. In one preferred form of the invention, the air driven motor is enclosed in the piston.

3,703,910

MEANS TO PREVENT EXTERNAL PLUG VALVE LEAKAGE

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Feb. 24, 1971, Ser. No. 118,450
Int. Cl. F16k *27/12, 5/02*
U.S. Cl. 137—375 16 Claims



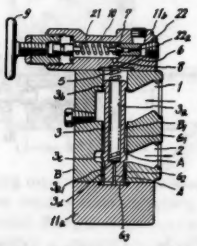
The tapered plug of the valve is provided with two adjustments: (a) three plug alignment set screws which properly position the plug to obtain a tight line seal and proper port alignment with the body ports, and properly align external sealing means with plug external seal surfaces, and (2) a plug end adjustment to micrometrically compress a plug shoulder seal against external leakage along the actuating stem.

3,703,911

REDUCING VALVE

Toshihiko Horikiri, Yokohama, and Ryuta Tsuji, Inba, both of Japan, assignors to Kabushikikaisha Tokyo Keiki (Tokyo-Keike Co., Ltd.), Tokyo, Japan

Filed Feb. 23, 1971, Ser. No. 117,902
Claims priority, application Japan, March 3, 1970, 45/20238
Int. Cl. G05d *16/00*
U.S. Cl. 137—491 7 Claims



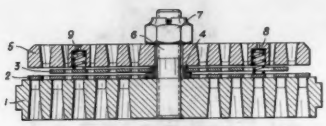
A reducing valve having a body, inlet and outlet ports formed therein, a spool slidably inserted in the body, lower and upper covers of the body, a poppet valve formed in the upper cover of the body for adjusting the pressure of a fluid in the outlet port, and an adjusting device for adjusting the position of the spool in the body so as to prevent generation of a surge pressure in the outlet port.

3,703,912

PLATE VALVE

Friedrich Bauer, Vienna, Austria, and Robert Kohler, Schongau/Lech, Germany, assignors to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Feb. 17, 1971, Ser. No. 116,149
Claims priority, application Austria, Feb. 18, 1972, A 1449/70
Int. Cl. F16k *15/08*
U.S. Cl. 137—514 6 Claims



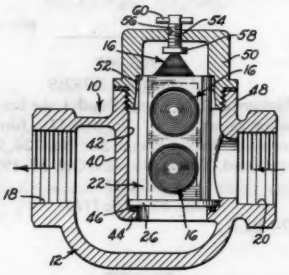
A plate valve especially adapted for use in reciprocating compressors and comprising a valve seat, a valve guard spaced from the valve seat, a valve plate serving as a closing member, and a damping plate interposed between the valve plate and the valve guard.

3,703,913

AUTOMATIC RATE OF FLOW CONTROL VALVE

Paul W. Carsten, Malibu, Calif., assignor to CVC Company, Santa Ana, Calif.

Filed Aug. 2, 1971, Ser. No. 168,316
Int. Cl. F16k *15/14*
U.S. Cl. 137—599 10 Claims



An automatic rate of flow control valve comprising an orifice plate and a conically shaped helical spring including a series of coils of decreasing diameter from a base coil on an upstream face of the plate, the inner diameter of each coil being equal to or greater than the outer diameter of the coils upstream thereof.

3,703,914

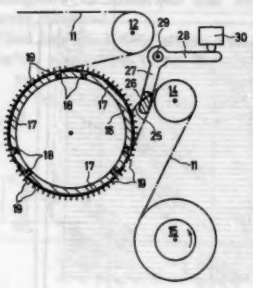
ROLL ARRANGEMENT FOR A TEXTILE MACHINE,

Erhard Freisler, Ruti, Zurich, Switzerland, assignor to Ruti Machinery Works, Ltd., formerly Caspar Honegger, Ruti, Zurich, Switzerland

Filed Dec. 12, 1969, Ser. No. 884,596
Claims priority, application Switzerland, Dec. 24, 1968, 19281/68
Int. Cl. D03d *49/20, 51/18*
U.S. Cl. 139—308 7 Claims

A roll arrangement for a textile machine comprising a rotatable roll, a plurality of curved segments mounted on said roll, the curvature of each of said segments matching the curved form of the roll and outwardly projecting pins carried

on the segments. The segments are in the form of plates which are made of metal or plastic material and contain orifices.



Each of the pins have a point at one end and a head at the other, and are secured to the plates, the head of each pin being held in one of the orifices.

3,703,915

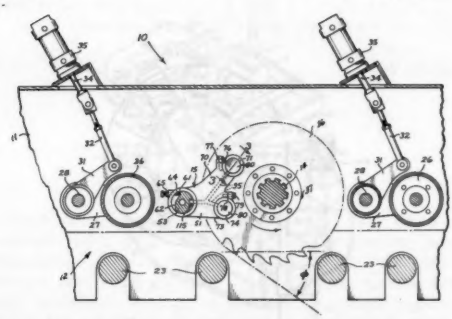
THIN KERF SAW MACHINERY

Harry C. Pearson, Beaverton, Oreg., assignor to Portland Iron Works, Portland, Oreg.

Filed Aug. 14, 1970, Ser. No. 63,862

Int. Cl. B27b *5/34*

U.S. Cl. 83—824 **14 Claims**



Thin kerf saw machinery including a saw arbor mounted for rotation above a set of power rollers adapted to transport lumber past the arbor for cutting. A plurality of saw collars are arranged on the arbor in side-by-side relationship, each collar being suspended for free lateral movement along the arbor and adapted to be rotated therewith. Each saw collar supports a circular saw blade fabricated of relatively thin gauge metal for thin kerf sawing. Saw guides are provided for each blade, being retained in control arms positioned adjacent the blades. The saw guides are adapted to exert selective forces on the sides of the saw blades near the gullet line of the blades for independently controlling the position of each blade as it enters the lumber. Each saw guide comprises at least a pair of control pads secured in opposed relationship, one on each side of a corresponding saw blade. The head surfaces of the pads are recessed to form fluid-retaining cups which confine a lubricating cushion of fluid adjacent the sides of the saw blades, when rotating. Fluid for filling the lubrication cups and operating the control pads is furnished from a remote source through a network of internal channels in the control arms. In one preferred arrangement, two sets of saw guides are used on each blade, the sets being separated between 60° and 120° along the outer periphery of the blade.

3,703,916

SCREWDRIVER WITH AN EXCHANGEABLE TIP

Owe Wilhelm Sundsten, Johanneshov, and Karl Bertil Sune Johansson, Huddinge, both of Sweden, assignors to Skandinavisk Foto Trade A B, Nacka, Sweden

Filed May 19, 1971, Ser. No. 144,976

Int. Cl. B25b *15/02;* **B23b** *31/12*

U.S. Cl. 145—50 R **3 Claims**

In a screwdriver with a handle supporting a coaxial rod and a sleeve surrounding the rod, the forward free end of the rod is tapered to engage, when desired, the inside of the tapered forward end of the sleeve. In the forward end of the rod is a slit for receiving the flat rear end of an exchangeable screwdriver tip. When moving the sleeve axially relatively the rod in one direction by means of a control member, the legs of the rod defining the sides of the slit will engage the inside of the tapering sleeve end and press the legs against the tip to secure it to the screwdriver, whereas movement in the opposite direction will release the tip.

3,703,917

VEGETABLE PROCESSING APPARATUS

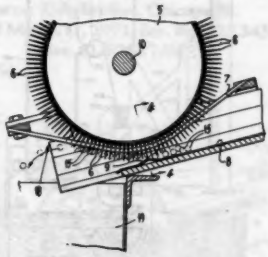
Frank Percival Mundy, Donvale, Victoria, Australia, assignor to Pict Limited, Notting Hill, Victoria, Australia

Filed Dec. 28, 1970, Ser. No. 101,546

Claims priority, application Australia, Jan. 26, 1970, 95/70

Int. Cl. A47j *23/00;* **A23b** *7/02*

U.S. Cl. 83—2 **4 Claims**



The invention provides apparatus for the pricking of vegetable pulse skins with improved means for guiding the pulses to and removing them from a rotating pin-drum.

3,703,918

HOUSEHOLD UTENSILS

Alfred Borner, Pickliebemer Str. 6, Dudeldorf, Germany

Filed Feb. 16, 1970, Ser. No. 11,477

Claims priority, application Germany, Feb. 17, 1969, P 19 07 858.1

Int. Cl. B26d *3/26*

U.S. Cl. 83—425.3 **5 Claims**

A household utensil for cutting vegetables or fruit into strips includes a base plate having several parallel vertical blades projecting upward from the base plate which are equidistantly arranged in one or more rows at an angle to the cutting direction. One or more horizontal blades spaced above the base plate extend over the working width of the utensil and are located beyond the vertical blades in the cutting direction.

The product to be cut is moved backwards and forwards over the cutting arrangement. The front edge of each of the vertical

blades is sharpened or beveled only on the side or face nearer the cooperating horizontal blade.

3,703,919

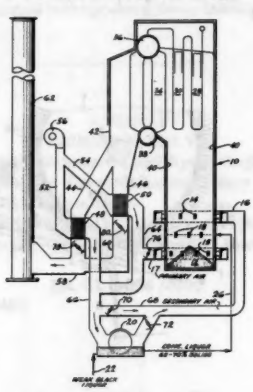
SUPPLEMENTARY AIR CASCADE EVAPORATION

Vincent P. Owens, West Simsbury, and George J. Prohazka, Simsbury, both of Conn., assignors to Combustion Engineering Inc., Windsor, Conn.

Filed Oct. 22, 1970, Ser. No. 83,102

Int. Cl. B01d *1/16, 1/14, 1/22, 47/00;* **F22d** *1/00*

U.S. Cl. 159—4 A **2 Claims**



A chemical recovery unit in which black liquor from a pulping process is burned including a direct contact evaporator for concentrating the black liquor prior to its introduction into a furnace. Preheated air is used as the heating medium in the direct contact evaporator. The moisture laden air leaving the evaporator is used as secondary combustion air in the furnace.

3,703,920

VENETIAN BLIND AND INSTALLATION

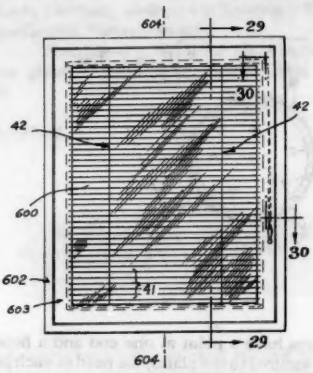
Victor Debs, Staten Island, N.Y., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.

Filed Jan. 28, 1970, Ser. No. 6,395

Int. Cl. E06b *9/02*

U.S. Cl. 160—107 **25 Claims**

The front and rear sidepieces of the ladders are connected to front and rear horizontal runs of a tilt cord at eyelets which are spaced along the horizontal runs. The tilt and lift cords are connected to individual spool members of a cord-operating unit. The blind is adapted to be combined with a window having metal framing and, where the window has spaced glazings, the ladder-and-slat assembly is adapted to be located between



the glazings. The spool members of the operating unit are adapted to be located in a channel of the window framing.

3,703,921

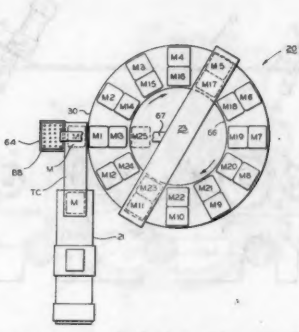
METHOD AND APPARATUS FOR CASTING IN MOLDS RADIALLY DISPLACED ON ROTATING TABLE

William Allan Hunter, Palantine, Ill., assignor to Heatherwill Company, Palatine, Ill.

Filed Nov. 30, 1970, Ser. No. 93,702

Int. Cl. B22d *5/02*

U.S. Cl. 164—130 **20 Claims**



A mould handling machine has a rotating mould receiving table adapted to hold a plurality of filled moulds which are arranged on the table in concentric rows having a center of rotation corresponding to the center of rotation of the table. The table is indexed through successive stop positions in its rotative movement at regular angular intervals to receive a mould ready for pouring. The movement of such mould on to the table radially displaces a poured mould which has gone through a full revolution on the table, and the filled mould at the inner-most row along such radius is displaced to a mould dump at the center of the table. The mould received at a stop position of the table is covered by a mould weight, and the covered mould moves with such weight to a pouring station displaced angularly from the stop position. The poured mould rotates with the table, cooling of the casting material taking place during such rotation. The poured mould is pushed radially inward after completing a revolution, when a fresh mould is received on the table, a filled mould on the innermost row which has gone through the complete cycles of rotation being then pushed to the mould dump.

3,703,922

PROCESS FOR THE MANUFACTURE OF NODULAR CAST IRON

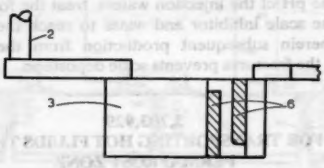
Clifford M. Dunks, and James L. McCaulay, both of Reigate, England, assignors to Materials and Methods Limited, Reigate, Surrey, England

Filed July 16, 1969, Ser. No. 842,204

Claims priority, application Great Britain, July 17, 1968, 33,970/68

Int. Cl. B22d *27/18, 27/20*

U.S. Cl. 164—57 3 Claims



The invention relates to a casting process for the production of castings of nodular cast iron. Molten flake iron is poured into the casting mould by way of an intermediate cavity which contains the nodularising agent.

3,703,923

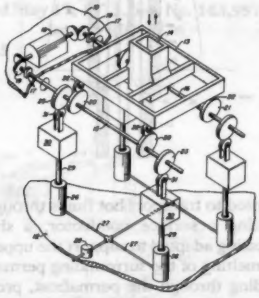
BALANCING MECHANISM AND METHOD FOR CONTINUOUS CASTING MOLDS

Alfred Teplitz, Pittsburgh, Pa., assignor to United States Steel Corporation

Filed Nov. 12, 1970, Ser. No. 88,781

Int. Cl. B22d *27/08*

U.S. Cl. 164—260 6 Claims



A mechanism and method for balancing the forces applied to a continuous-casting mold as it oscillates and thereby minimizing vibration in the supporting structure. The mold is oscillated by cams which engage cam followers on the mold frame. Auxiliary cams engage cam followers on a balancing mass to move the latter always in the opposite direction from the mold. The balancing mass is approximately equal to the mass of the mold and parts which oscillate therewith.

3,703,924

APPARATUS FOR INTRODUCING MOLTEN METAL INTO A STRAND CASTING MOLD

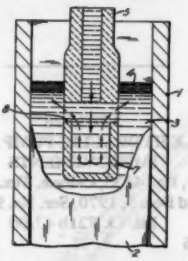
Howard E. Whisler, Harrison; Bhupendra Umedchand Shah, Canton; Gerald Vernon Jeskey, Hartville, and Ray Albert Bloom, North Canton, all of Ohio, assignors to The Timken Roller Bearing Company, Canton, Ohio

Filed Oct. 9, 1970, Ser. No. 79,500

Int. Cl. B22d *37/00*

U.S. Cl. 164—337 1 Claim

A nozzle consisting of a pouring tube and a return cup extends down into a strand casting mold for pouring molten metal into it. The return cup is suspended in the mold at the lower end of the pouring tube and is submerged below the liquid level in the mold in a position to receive the metal issuing from the pouring tube and redirect it upwardly along the inside wall of the cup. The cup is dimensioned and located so that the eddies that are formed by the countercurrent flow of metal therein will lose their intensity before reaching the bottom and will die out before reaching the openings in the upper part of the cup through which the upwardly flowing metal escapes into the surrounding mold. The inside of the cup is large enough for its side wall and upper face of its bottom to



be free from the eddies, while the outside of the cup is small enough to keep the metal that flows down around the outside of the cup from accelerating. The result is that the molten metal leaving the cup is substantially free of turbulence and flows in such a manner that the objectionable inclusion materials in the metal float up to the top of the molten body of metal in the mold around the cup instead of being carried down into the casting strand to contaminate the product upon solidification.

3,703,925

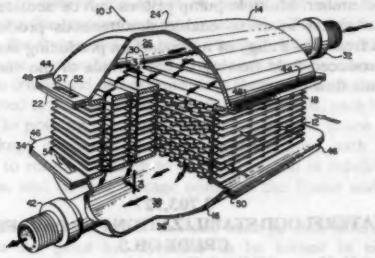
HEAT EXCHANGER CORE

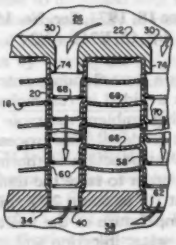
Robert G. Ireland, Indianapolis; Fred L. Manis, Greenwood, and Ross W. Teeguarden, Indianapolis, all of Ind., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed March 11, 1971, Ser. No. 123,343

Int. Cl. F28d *1/04*

U.S. Cl. 165—151 2 Claims





A tube and fin type heat exchanger core made up of unique and identical plate strip structures having formed extrusions,

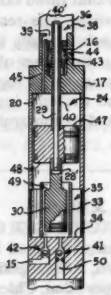
the extrusions nesting when the plates are stacked to form the tubes and the portions of the plates between the extrusions forming the fins. The extrusions form trough-like projections with a number of holes in the bottoms of the trough-like projections to permit the flow of fluid between the plate structures. The walls of the projections have offset portions to serve as spacing means between the plates. A slight crimp or bend is provided in the plate portion between each extrusion to facilitate the assembly of the plate structures regardless of small deviations in the spacing dimensions between extrusions.

3,703,926

DOWNHOLE HYDRAULIC PUMP AND ENGINE IMPROVEMENTS

George K. Roeder, Box 4335, Odessa, Tex.

Filed Dec. 3, 1970, Ser. No. 94,905
Int. Cl. F21b *43/00*
U.S. Cl. 166—106 **10 Claims**



A downhole hydraulically actuated pump having an engine piston and a pump piston, with the pistons being arranged with diametrically opposed faces which operate within a common fluid chamber. Multiple pump pistons can be actuated by the engine piston so as to enable simultaneous production to occur from a pluraligy of hydrocarbon producing zones, with the produced fluid flowing to the surface of the earth along separate flow paths.

3,703,927

WATERFLOOD STABILIZATION FOR PARAFFINIC CRUDE OILS

Robert Y. Harry, Midland, Tex., assignor to Cities Service Oil Company

Filed June 18, 1971, Ser. No. 154,618
Int. Cl. E21b *43/24*
U.S. Cl. 166—272 **6 Claims**

Disclosed herein is a waterflooding process wherein paraffinic precipitation is avoided in reservoirs containing paraffinic crude oils, having ambient reservoir temperatures near the pour point of the crude oil. The process of the present invention involves the introduction of thermal energy into the waterflood media in order to raise the temperature of the injected water to about 10° to about 20°F. higher than the pour point or ambient temperature of the reservoir. Through this energy addition, the water injection and subsequent drive of crude oil through the reservoir does not significantly lower the temperature of the paraffinic crude so as to avoid precipitation of paraffin within the reservoir and provide an efficient waterflooding procedure.

3,703,928

OIL RECOVERY UTILIZING ACIDIC ORGANIC PHOSPHATE SCALE INHIBITORS

Richard S. Fulford, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed Feb. 24, 1971, Ser. No. 118,503
Int. Cl. E21b *43/22*
U.S. Cl. 166—275 **1 Claim**

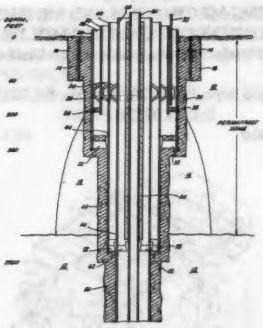
Disclosed herein is a method for the reduction of scale deposition in a formation and fractures about a producing wellbore. In particular, an acidic organic phosphate scale inhibitor is introduced into a waterflooding medium so as to lower the pH of the injection waters, treat the formation and allow the scale inhibitor and water to reach the production well wherein subsequent production from the formation, through the fractures prevents scale deposition.

3,703,929

WELL FOR TRANSPORTING HOT FLUIDS THROUGH A PERMAFROST ZONE

Robert W. Rardin, Anchorage, Alaska, assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 6, 1970, Ser. No. 87,449
Int. Cl. E21b *43/24*
U.S. Cl. 166—302 **15 Claims**



A well adapted to transport hot fluids through a permafrost zone comprising a surface conductor, a short section of refrigerated casing adapted to support the upper section of the well without melting of the surrounding permafrost, a surface casing extending through the permafrost, production casing and production tubing. All casing strings are supported in the well so that the upper sections are in compression. Pressure integrity between casing strings is maintained by packing glands in the well head. Also, a short section of casing can be provided in the annulus exterior of the surface casing to provide a separately enclosed refrigeration reservoir, or to provide for circulation of refrigerant.

3,703,930

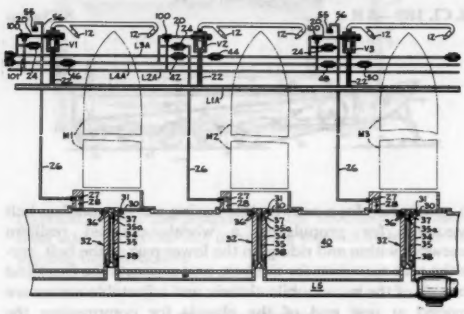
AUTOMATIC SPRINKLING SYSTEM

Wilton S. Lofstrand, Minneapolis, Minn., and John G. Montgomery, Arlington, Va., assignors to FMC Corporation, San Jose, Calif., by said Lofstrand

Filed May 27, 1971, Ser. No. 147,485
Int. Cl. A62c *3/00*
U.S. Cl. 169—2 R **11 Claims**

An automatic sprinkling system for a plurality of missiles or other highly combustible objects includes sprinkler heads arranged to supply streams of water individually to each missile. A fire detection means is provided for each missile and a control valve controls the flow of water to the sprinkler heads for each missile with the detection means being hydraulically connected with the control valve so as to open the same upon the actuation of the detection means. A system of check valves

and control lines interconnects all of the control valves so that upon actuation of the detection means for any one missile the control valves of each of the adjacent valves will be opened along with the control valve for the missile which is on fire



whereupon a maximum supply of water will be delivered immediately to the area where it is needed. The invention herein described was made in the course of or under a contract with the Department of the Navy.

3,703,931

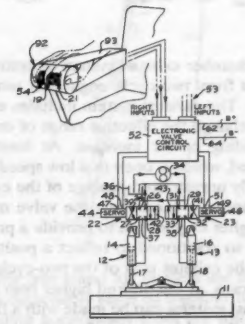
ELECTRO-HYDRAULIC TOUCH CONTROL SYSTEM FOR EARTHMOVING VEHICLES

Russell D. Page; Dean C. Klingaman, both of Decatur, and Rolland D. Scholl, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 17, 1971, Ser. No. 143,957

Int. Cl. E02f 3/76

U.S. Cl. 172—4.5 **15 Claims**



An implement control for an earthmoving vehicle comprising an electro power unit, electro-hydraulic valves and complementing hydraulic equipment for raising or lowering the right and lefthand sides of the implement responsive to electrical control signals, control switches preferably actuatable by operator touch for selectively operably connecting the power unit to the valves to thereby apply the electrical control signals thereto, and an operator manipulatable potentiometer associated with the power unit to selectively influence the system to permit operators to individually select desired degrees of control response. Such arrangement enables vital control components to be more satisfactorily located to enhance operator convenience and machine efficiency and makes possible more effective and economical remote control systems for earthmoving applications.

3,703,932

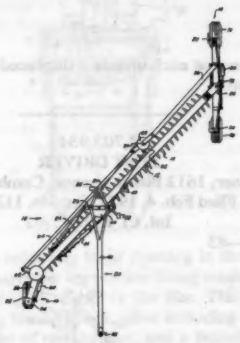
DISC TILLER

Floyd W. Tuttle, Tribune, Kans., and Ralph W. Tuttle, Ulysses, Kans.

Continuation-in-part of Ser. No. 745,882, July 18, 1968, Pat. No. 3,543,865. This application Aug. 31, 1970, Ser. No. 68,148

Int. Cl. A01b 69/00

U.S. Cl. 172—288 **6 Claims**



A single-unit and a multiple-unit earth worker are provided. An elongated frame has earth-working members supported therebelow. A transversely disposed support member is centrally and pivotally attached to the rear end of the frame to pivot in a horizontal plane. The forward end of the frame has a pivotally mounted hitch, and a pivotally mounted wheel. The rear support member has a caster wheel mounted on each end. A first link connects the rear support member and the forward wheel, the link restraining same in normal position and operable to horizontally angle the wheel. A second link connects the first link and is rigidly connected to the hitch. A restraining link connects the transverse support member at the rear and the frame to restrict the extent of pivotal movement of the frame about the transverse support member. Turning linkage connects the frame and the hitch member. In the multi-unit embodiment, a plurality of caster wheels is used, one on each end of the frame and on opposite sides thereof. Caster linkage is connected to the hitch and the end caster wheels, such being operable to position the caster wheels relative the frame. Angular linkage connects the hitch and the frame, with such operable to rotate the hitch to proper position in relation to the frame, and turning linkage connects the frame and the hitch.

Numerous types of earth workers such as disc tillers are known in the prior art operable to be turned in either direction, to the right or left. However, these disc tillers are one normally operable to be pulled with the discs inclined in one direction and turn more easily in one direction than the other. Also, many of the prior art devices are adjustable for the depth of the cut by varying the height at the wheel supports; this is usually done by a hand adjustment.

3,703,933

IMPACT WRENCH WITH TORQUE CONTROL MEANS

Knut Christian Schoeps, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed April 13, 1971, Ser. No. 133,647

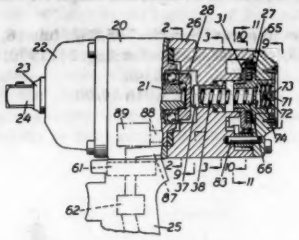
Claims priority, application Sweden, April 24, 1970, 5745

Int. Cl. B25b 21/02

U.S. Cl. 173—12 **9 Claims**

In an impact wrench provided with torque control means, a cut-off for the wrench drive motor is activated at attainment in

an adding mechanism of a predetermined sum total of the lengths of displacement of a body which in response to rotational resistance at each impact is displaced against the action of a return force.



3,703,934

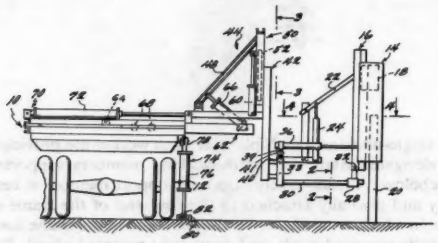
POST DRIVER

Jack O. Cartner, 1612 Blaine Avenue, Cambridge, Ohio

Filed Feb. 4, 1971, Ser. No. 112,544

Int. Cl. E21c *11/02*

U.S. Cl. 173—43 **5 Claims**



A truck-mounted post driver comprises a conventional driver head disposed laterally of the truck bed and mounted for controlled tilting movement in two vertical planes parallel to and transverse to the longitudinal axis of the truck so that the head may be plumbed with respect to a vertical post. The head is carried by an adjustable frame assembly by means of which it can be positioned horizontally and vertically and retracted to a position on the truck body.

3,703,935

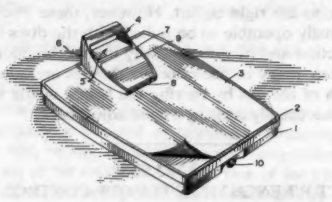
WEIGHING SCALE WITH CONCEALABLE DIAL

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Chicago, Ill.

Filed Dec. 28, 1970, Ser. No. 101,877

Int. Cl. G01g *23/02*

U.S. Cl. 177—124 **11 Claims**



A weighing scale is provided of the type having a weight indicating dial adjacent the weighing platform wherein a cover for said dial is mounted adjacent the dial and is adapted to open and close so that the dial will be exposed to view when the cover is open and covered when the cover is closed, the opening of the cover being actuated automatically in response to weight being applied to the platform.

3,703,936

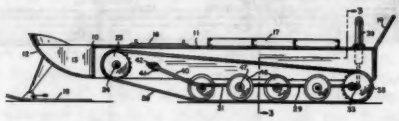
SNOWMOBILE SUSPENSION

Herbert W. Padwick, 93 Calder Crescent, and Lawrence P. Fay, 628 Royal Street, both of Regina, Saskatchewan, Canada

Filed Sept. 24, 1970, Ser. No. 75,440

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **8 Claims**



A suspension for a snowmobile having a driven endless belt thereunder for propulsion; a wheel-supported resilient framework within and riding on the lower part of the belt, carries the rear sprockets for the belt, and supports the front and rear ends of the snowmobile chassis; and adjustable means are provided at one end of the chassis for compressing the framework against the sprockets at the opposite end of the framework for increase in the resilient chassis support, and to maintain the belt tight on the sprockets.

3,703,937

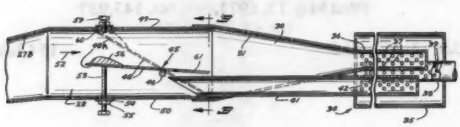
MULTIPLE RPM RANGE TUNED EXHAUST PIPE AND SILENCER FOR TWO-CYCLE ENGINE

William L. Tenney, Crystal Bay, Minn.

Filed May 21, 1971, Ser. No. 145,746

Int. Cl. F01n *1/08, 1/20, 3/00*

U.S. Cl. 181—36 R **34 Claims**



An expansion chamber exhaust system operative to obtain high power output from two-cycle engines at more than one engine rpm range. The exhaust system includes automatic or manual means to change the effective range of engine rpm at which it is providing power increase. At least one valve member is provided, which is open in a low speed position, to permit substantially unrestricted passage of the exhaust gases and exhaust gas pressure waves past the valve member, and which closes at higher engine rpm to provide a pressure wave reflecting surface so positioned to reflect a positive pressure wave to arrive at the exhaust port of the two-cycle engine just before the port closes, at the desired higher rpm range of the engine. The exhaust systems can be made with a fixed positive wave reflecting surface downstream from the valve member, or they may open directly to atmosphere downstream from the valve member, and they may include a silencing muffler, is desired.

3,703,938

EXHAUST MUFFLER

Ralph H. Nelson, Stoughton, Wis., assignor to Nelson Muffler Corporation, Stoughton, Wis.

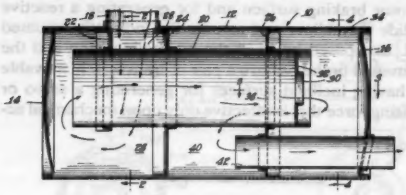
Filed April 6, 1971, Ser. No. 131,657

Int. Cl. F01n *1/08*

U.S. Cl. 181—58 **10 Claims**

The present invention relates generally to improvements in mufflers, or silencers for internal combustion engines. The muffler device disclosed herein comprises an improved, compact and very unique expansion chamber for receiving exhaust gases directly from an internal combustion engine. This

chamber accommodates a tube-like structure which is so disposed that gases initially received by the chamber are first



directed against the periphery of the tube-like structure and then into a progressively increasing expansion area surrounding said tube structure.

3,703,939

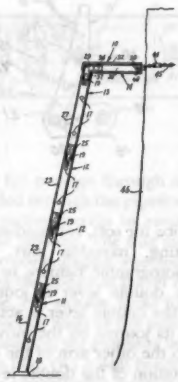
PORTABLE TREE STAND

Edward Ralph Maxwell, 607 W. Pope Street, Dunn, N.C.

Filed Jan. 15, 1971, Ser. No. 106,747

Int. Cl. E06c *1/10*

U.S. Cl. 182—107 **4 Claims**



A portable tree stand for hunters use formed of a plurality of sections detachably secured together to support a seat section extending horizontally from the top of the erected sections to engage a tree. A chain and turnbuckle system encompasses the tree and draws a spike carrying bar into engagement with the tree with the spikes embedded in the tree.

3,703,940

AIR STREAM OIL-INJECTING TYPE OILER

Teruo Morita, Saitama-ken, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

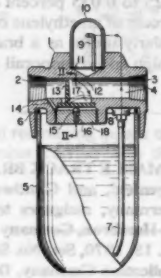
Filed July 29, 1970, Ser. No. 59,319

Claims priority, application Japan, Aug. 1, 1969, 44/72682

Int. Cl. F16n *7/34*

U.S. Cl. 184—55 A **2 Claims**

An air stream oil injecting device includes a base portion having a bore through which air is adapted to flow, a depending oil reservoir secured to the base portion, and an inverted bell-shaped dropping window, sealingly secured to the base portion, and containing an oil dropping pipe, the interior of the dropping window communicating with the air flow passage through a small hole. The air dropping pipe is in communication with an oil feed pipe in the reservoir. A T-shaped damper, of resilient material, such as rubber or the like, includes a main damper portion normally extending across the air flow passage and having substantially the shape of the latter, this damper portion being integral with a leg portion which closes,



from beneath, a relatively large opening in the lower wall of the air flow passage, the leg portion being retained in position by a threaded plug of rubber or the like. This threaded plug contains a spring biased check valve including a ball engaged by the leg portion of the damper, and a branch passage connects an upstream passage of the air flow passage to a space beneath the leg portion of the damper for leakage of air around the ball check valve into the reservoir. The opening in the lower wall of the air passage forms a recess or groove into which the tongue portion of the damper can be deflected by air under pressure, flowing through the air flow passage, to provide a substantially uninterrupted air flow through the air flow passage.

3,703,941

PARKING BRAKE

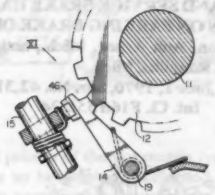
Koichi Ohie, Tokyo, and Koji Enomoto, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 15, 1971, Ser. No. 106,658

Claims priority, application Japan, Jan. 17, 1970, 45/4262

Int. Cl. B60t *1/06*

U.S. Cl. 188—31 **3 Claims**



A parking brake for use with an automatic power transmission mechanism having a parking gear which is engaged or disengaged by a brake pawl with or from a brake pawl upon shifting movement of a rotary shaft through a mechanical linkage. A cam member is rotatably mounted around the rotary shaft and is operatively connected thereto by a torsion spring. Rotation of the rotary shaft in one direction causes rotation of the cam member in the same direction to move the brake pawl into engagement with the parking gear thereby locking it against rotation in either direction. If the tooth of the brake pawl is misaligned with respect to a space between two adjacent teeth of the parking gear, the torsion spring yields and exerts a pressure on the brake pawl that tends to urge it toward the braking or locking position. When the parking gear moves slightly, the spring force will snap the brake pawl into braking position.

3,703,942

GEL COMPOSITION AND ITS USE AS A BRAKING MEDIUM

John P. Brown, Alto, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Feb. 16, 1971, Ser. No. 115,742
Int. Cl. B61h 9/00
U.S. Cl. 188—33 3 Claims

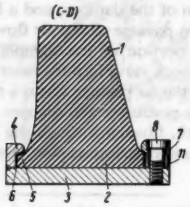
A gel composition is provided which on a weight basis consists essentially of 94.0 to 94.4 percent water, 5.50 t0 5.75 percent fumed silica, 0.025 to 0.035 percent of a fatty diamine and 0.002 to 0.004 percent of an ethylene oxide polymer. The composition is particularly useful as a braking medium in a method for stopping high speed monorail sleds employed in aerospace research.

3,703,943

DEFORMABLE TRACK BRAKE

Franz Preinfalk, Langenfeld, and Gunther Meuters, Moers-Asberg, both of Germany, assignors to August Thyssen-Hutte AG, Duisburg-Hambron, Germany

Filed Oct. 15, 1970, Ser. No. 80,858
Claims priority, application Germany, Dec. 24, 1969, P 19 64 812.5
Int. Cl. B61k 7/02
U.S. Cl. 188—62 6 Claims



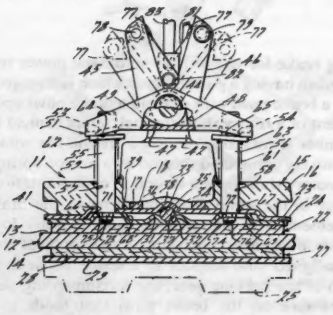
Deformable rubber track brake having a rubber rail secured to a foundation one side of which has a curb which overreaches a flange at the base of the rubber rail. The other side of the foundation is provided with a holder for limiting the lateral movement of the rail.

3,703,944

DISK PARKING AND SERVICE BRAKE HAVING SERVO ACTION ON PARKING BRAKE ONLY

Paul G. Hendrickson, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed June 1, 1970, Ser. No. 42,310
Int. Cl. F16d 55/224
U.S. Cl. 188—72.2 11 Claims



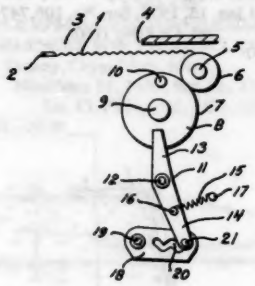
A sliding caliper type disk brake assembly including a directly actuated brake pad that is movably supported relative to the caliper assembly and an indirectly actuated brake pad that is fixed relative to the caliper assembly. A hydraulic piston and mechanical actuator are provided for moving the directly actuated brake pad into engagement with the associated rotor braking surface and for generating a reactive force to slide the caliper and actuate the indirectly actuated brake pad. Interposed between the hydraulic piston and the directly actuated brake pad are a pair of transversely movable members having inclined surfaces for generating a servo or self-energizing force that is effective only upon mechanical actuation.

3,703,945

CUSHIONING DEVICE FOR MECHANICAL DETAILS IN PHOTOGRAPHIC CAMERAS AND SIMILAR PRECISION APPARATUS

Lennart Gunnar Oskar Dahlgren, Vastra Frolunda, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed Dec. 4, 1970, Ser. No. 95,070
Claims priority, application Sweden, May 6, 1970, 6233/70
Int. Cl. F16d 63/00
U.S. Cl. 188—85 7 Claims



A cushioning device for soft, reboundless braking of an intermittently operating, movable part of a mechanical mechanism of a photographic camera or like precision apparatus in which a double lever is journaled adjacent its center, one arm of the double lever is actuated to rotate the double lever about its journal by the movable part, a return spring is attached to the other arm of the double lever and is tensioned by the rotation of the double lever by the movable part, a brake link is journaled at a point offset from the first journaling point, extends toward the first journaling point and has a zigzag groove formed therein and a pin on the other arm of the double lever engages the zigzag groove and causes the brake link to oscillate with an amplitude which increases as the pin approaches the first journaling point when the double lever is rotated by the movable part.

3,703,946

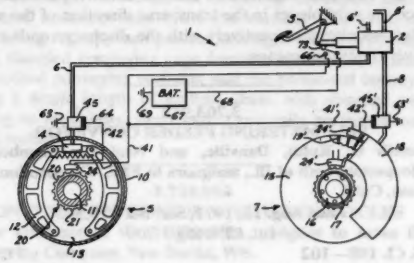
ANTI-SKID BRAKE SYSTEM

Robert Ondrasik, Elmhurst, N.Y., assignor to Patents & Technolohy Exclusives, Inc., New York, N.Y.

Filed May 1, 1970, Ser. No. 33,661
Int. Cl. B60t 8/08
U.S. Cl. 188—181 R 14 Claims

An anti-skid braking system of economical construction in which a sensing device in the form of a switch includes a magnetic actuator responsive to either teeth on a rotor or the vanes of a disc brake to intermittently operate the switch in response to wheel rotation of a vehicle equipped with the

system. The switch is connected to a device for pulsing the brake system at the rate of operation of the switch. The system is so arranged that it operates to pulse the brake system only



when the brake pedal is depressed and the speed of rotation of a wheel is less than 5 miles an hour. At higher speeds the system is inactive.

3,703,947

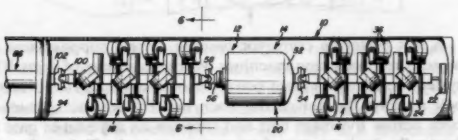
INTERNAL PIPELINE COATING APPARATUS

Ira T. Landrum, Hobbs, N. Mex., assignor to Internal Pipeline Services, Inc., Tulsa, Okla.

Filed March 8, 1971, Ser. No. 121,802

Int. Cl. F16d *57/00*

U.S. Cl. 188—290 **9 Claims**



A slug assembly for passage through a pipeline and to be controllably propelled through the pipeline as a sliding restrictive fluid by-pass piston therein in response to fluid being pumped through the pipeline. The slug assembly includes (1) pipeline interior surface engaging wheeled brake structure for controllably braking the speed of travel of the slug assembly through the pipeline, (2) storage tanks for treating liquids to be applied to the interior walls of the pipeline, (3) a wall friction driven pump assembly for pumping liquids from the tanks through a discharge line, (4) a wall friction driven liquid metering assembly for controllably metering the flow of liquid through the discharge line, and (5) a controlled fluid by-pass sliding piston assembly for developing a travel thrust on the slug assembly for movement of the latter through the pipeline in response to a differential between fluid pressures within the pipeline on opposite sides of the piston assembly, the fluid by-pass portion of the piston assembly incorporating a fluid turbine structure driving a trailing rotary spray head to which the liquid discharge from the liquid metering assembly is supplied.

3,703,948

RECIPROCALLY ENGAGEABLE CLUTCH MECHANISM

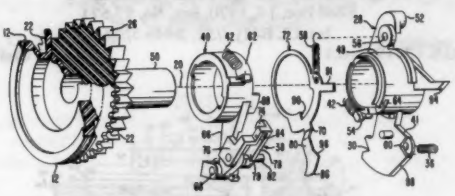
Ronald H. Mack, Plymouth; Robert H. Wilczewski, Northville, both of Mich., and Nicholas Kondur, Jr., Rolling Meadows, Ill., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 26, 1971, Ser. No. 119,170

Int. Cl. F16d *43/00*

U.S. Cl. 192—33 R **18 Claims**

A clutch mechanism for reciprocatingly engaging a driven member with a driving member wherein the driven member is biased in one rotational direction and alternately driven over a predetermined arc in the opposite direction. The respective angular positions of engagement and disengagement of the driven member with the driving member are determined by



angularly displaced restraining means that actuate an engagement control member carried with the driving and driven members.

3,703,949

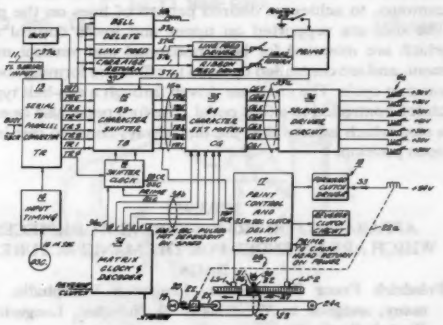
HIGH-SPEED PRINTER

Robert Howard, Roslyn, N.Y.; Prentice I. Robinson, Hudson, and Herbert E. Menhennett, Windham, both of N.H., assignors to Centronics Data Computer Corporation, Hudson, N.H.

Filed May 7, 1970, Ser. No. 35,405

Int. Cl. B41j *25/00*

U.S. Cl. 197—1 R **23 Claims**

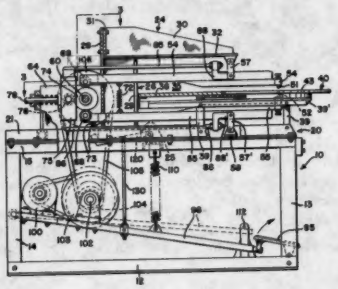


A high-speed printer of the dot matrix type in which incoming information to be printed, presented in either serial or parallel form, is examined for invalid bits and loaded into a buffer in parallel fashion. Printing does not begin until the buffer is loaded to print a line of the desired length. Printing begins as soon as the first character loaded into the buffer reaches the output stage at which time the actuation of the print wires of the dot matrix are moved across the paper document at a substantially constant speed. Detection of the location of the carriage assembly moving the printer head assembly is performed independent of the movement of the carriage to actuate the print wires at the appropriate locations. Logical circuitry is provided for detecting the presence of invalid characters and the buffer and serial-to-parallel converter are cleared prior to the loading of the next group of characters to be printed on the next line of print. During serial transmission, the printer assembly generates Acknowledge signals to indicate to the transmitting facility that the previous character has been received and stored.

3,703,950
APPARATUS FOR MAKING EMBOSSING PLATES FOR THE BLIND

George W. Armstrong, P.O. Box 507, and Conrad E. Siegfried, 1232 High View Drive, both of Fairborn, Ohio

Filed Dec. 14, 1970, Ser. No. 97,671
Int. Cl. B41j 3/32; B44b 5/00
U.S. Cl. 197—6.1 8 Claims

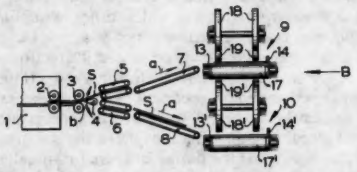


A press for forming braille-like line patterns of raised projections in embossing plates, for use in embossing sheets of paper in a printing press in making coloring books or the like for the blind. The press includes a rotary turn-table upon which the printing plates are supported while being embossed. A pair of forming dies engage the plates on the central axis of the table and form a raised dimple in the plates. The dies are mounted for movement in translation and are controlled in a cycle of operation to advance the plates through a small predetermined increment and then release and re-engage the plates at a new position for the purpose of forming a line of uniformly spaced dimples. The operator may rotate the plate on the platform to create curves and images, and to follow contours, to achieve a desired pattern of lines on the plate. The dies are supported on upper and lower control arms which are mounted for both horizontal and vertical movement, and are controlled by cams to effect the forming and advancing cycle. The cams are driven through a slip-belt type of clutch controlled to a foot pedal. The foot pedal also operates a stop which assures that the dies always come to rest in the open position.

3,703,951
APPARATUS FOR TRANSFERRING WORKPIECES WHICH ARE INTENDED FOR THE MANUFACTURE OF BAGS

Friedrich Franz Brockmuller, Lengerich Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed June 2, 1970, Ser. No. 42,806
Claims priority, application Germany, June 11, 1969, P 19 29 600.5
Int. Cl. B65g 47/68
U.S. Cl. 198—20 T 9 Claims

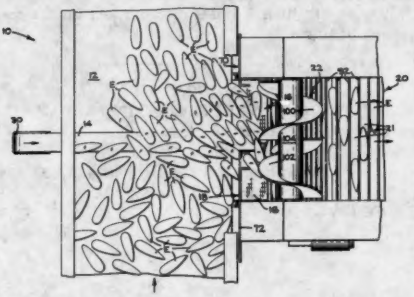


An apparatus for transferring workpieces, in particular tube portions for the manufacture of bags, which are continuously advance in a row in the longitudinal direction, into a row continuously advanced in the transverse direction comprises two delivery conveyor means for continuously advancing the workpieces in the longitudinal direction of the workpieces. A separator device feeds alternately the workpieces to the two delivery conveyor means. Two transverse conveyor means advance the workpieces in the transverse direction of the workpieces associated respectively with the discharge ends of the delivery conveyor means.

3,703,952
SELF METERING FEEDER CONVEYOR

Kenneth G. Kuhn, Danville, and Neal C. Chamberlain, Hoopeston, both of Ill., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 10, 1971, Ser. No. 170,543
Int. Cl. B65g 37/00
U.S. Cl. 198—102 7 Claims

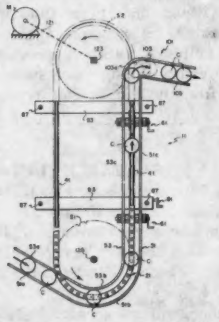


A self metering conveyor feeding system supplies one or more corn processing machines with husked ears of corn. The system comprises a main conveyor belt and a narrow diverter belt running flat across the main belt for advancing ears of corn across the main belt and through an adjustable gate to feed rolls, the latter transferring the ears to the flights of a take away conveyor. A reserve supply of ears of corn is maintained at the feed roll, and when the reserve is filled, the main conveyor merely advances the excess ears past the gate and on to a downstream diverter system, if such is provided.

3,703,953
CONVEYING ARRANGEMENT FOR CONTAINERS

Maynard C. Barker, Temple Terrace, Fla., assignor to Bangor Punta Operations, Inc., New York, N.Y.

Continuation of Ser. No. 788,136, Dec. 31, 1968, abandoned.
This application May 27, 1971, Ser. No. 147,682
Int. Cl. B65g 15/14
U.S. Cl. 198—162 32 Claims



A container-conveying arrangement is disclosed, having an endless guided conveyor chain with replaceable chain-guiding

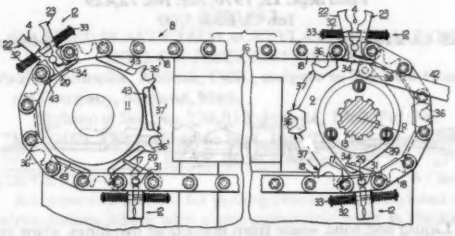
and containerengagable conveying caps or pads forming an articulated shingled or saw-toothed conveying surface. The basic conveyor chain and cap assembly is disclosed in several container-conveying embodiments, namely a container elevator, a container lowerator or lowering conveyor, and a horizontal container conveyor, the elevator and lowerator each having two opposed parallel conveyor chains with interfacing shingled conveying caps forming opposed articulated saw-toothed conveying surfaces, and the horizontal conveyor having a single length of endless chain with shingled caps forming an articulated saw-toothed generally horizontal conveying surface.

3,703,954

CONVEYOR SYSTEM FOR WIRE LIKE ARTICLES

Ragnar Gudmestad, West Allis, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed March 16, 1971, Ser. No. 124,752
Int. Cl. B65g *17/42*
U.S. Cl. 198—179 **8 Claims**



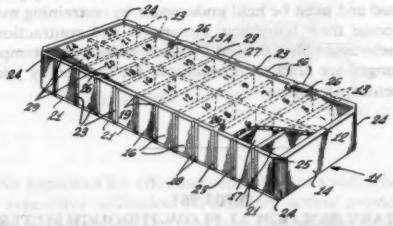
An endless chain having alternate pairs of inner and outer side bars moves in an oblong path around spaced sprocket wheels. Pairs of relatively swingable clamping jaws for electrical wire leads or the like are mounted at intervals on the chain and are nested between opposite side bars and associated hinge bushings thereof. Outwardly extending gripping arms of the jaws are spring biased toward each other and are temporarily swung apart into wire receiving and wire releasing positions by actuating fingers which project inward of the oblong path of chain travel and are engaged by cams at the sprocket wheels.

3,703,955

MULTIPLE COMPARTMENT DISPENSING BOX

Edward C. Inacker, 11842 Teale Street, Culver City, Calif.

Filed July 23, 1971, Ser. No. 165,572
Int. Cl. B65d *83/04, 17/24, 1/24*
U.S. Cl. 206—42 **10 Claims**



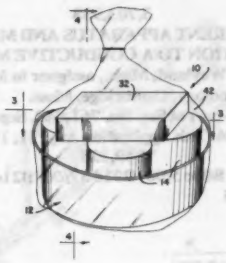
A dispensing box comprising a main body portion having a plurality of independent compartments therein and a cover interlocked with the box to close the compartments. The end walls of the compartments at the opposite sides of the box have reduced sections connecting them to the box proper which may be readily broken through so that the individual compartments may be opened for access by removal of their end walls without displacing the cover nor opening other compartments in the box.

3,703,956

OIL CHANGE KIT

Leon M. Oswalt, Guthrie, Okla., assignor to Cato Oil and Grease Co., Oklahoma City, Okla.

Filed Feb. 16, 1971, Ser. No. 115,576
Int. Cl. B65d *79/00, 85/62*
U.S. Cl. 206—47 R **11 Claims**



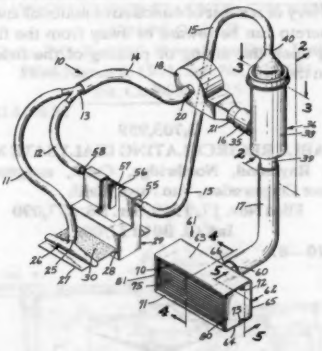
A packaged kit comprising a drain pan, a plurality of cans of oil, an adapter mountable within the drain hole of an oil pan for a remote opening and closing thereof, a collapsible funnel, and a plurality of flexible sealable liquid containers, all confined within a transparent wrapper.

3,703,957

PNEUMATIC SEPARATOR, FILTER AND PARTICLE CONVEYING SYSTEM

Kenneth W. Swanson, Route 2 Box 300, Excelsior, Minn.; William C. Rolland, 1618 Eustis Street, St. Paul, Minn., and Michael J. Kraft, 3809 E. Sibley, Savage, Minn.

Filed March 6, 1968, Ser. No. 711,114
Int. Cl. B04c *9/00*
U.S. Cl. 209—144 **3 Claims**



In dry copying machines utilizing particulate toner a particle conveying system including a plurality of pneumatic ducts and a blower with a vacuum-type pickup device attached to an inlet of the blower and positioned to remove loose particles from the copies as they egress from the copying machine, a centrifugal separator positioned in the pneumatic system to receive the air and particles from the vacuum pickup device and separate the particles from the bulk of the air, a particle settling chamber having baffles therein attached to the copying machine and receiving separated particles from the separator so as to return them to active use in the copying machine and further having an outlet duct attached to the blower to reduce the pressure therein slightly below atmospheric, and a filter assembly attached to the air outlet of the separator so that air leaving the separator is filtered prior to being returned to the atmosphere. The filter assembly is

constructed from an extruded plastic housing having two sidewalls and a joining wall connected to provide a U-shaped cross section and a pleated filter element connected to the sidewalls opposite the joining wall and end walls formed of plastic while in its formable state and subsequently hardened to provide sealing engagement with the ends of said housing and pleated filter.

3,703,958

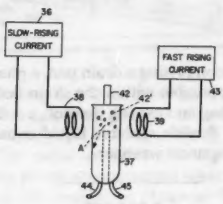
EDDY CURRENT APPARATUS AND METHOD OF APPLICATION TO A CONDUCTIVE MATERIAL

Henry H. Kolm, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 761,048, Sept. 20, 1968, Pat. No. 3,567,026. This application Aug. 11, 1969, Ser. No. 849,128

Int. Cl. B03c *5/00*; B01d *37/00*; B21d *26/02*

U.S. Cl. 210—65 **14 Claims**



Eddy current apparatus is disclosed for applying a force to a conductive material. The apparatus employs two magnetic fields. The first, a background or soaking field, is continuous or slow rising and has a skin depth that is greater than the dimension of the material in the direction of field penetration. The second is fast-rising and has a skin depth that is less than said dimension. The two fields are timed or phased and oriented with respect to each other to produce the force in a desired direction. Thus, the conductive material can be particles in a slurry or a sheet of conductive material and the force applied thereto can be toward or away from the field source depending upon the timing or phasing of the fields and the orientation thereof.

3,703,959

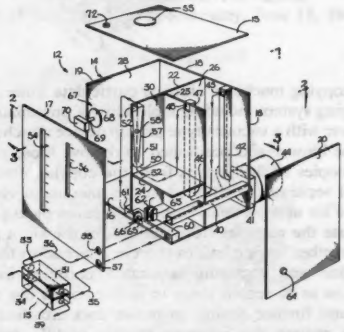
DISPOSABLE RECIRCULATING DIALYSATE MODULE

Julius R. Raymond, Northridge, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Nov. 17, 1969, Ser. No. 877,090

Int. Cl. B01d *31/00*

U.S. Cl. 210—87 **10 Claims**



A disposable module containing all equipment, instruments and material required to circulate and treat the dialysate solution during the treatment of the patient. The module is of inexpensive construction so that it can be thrown away after a single treatment. When the artificial kidney membrane is separate from the module, two lines connect the module to the artificial kidney membrane and when the artificial kidney membrane is contained in the module, two lines connect the module directly to the patient. The module contains separate compartments for the chemicals which treat the dialysate solution and has separate compartments which serve as a reservoir and as a container for a reconstitution fluid. All passages are formed integral with the module and all instruments are of simple, cheap construction which can be disposed of with the module.

3,703,960

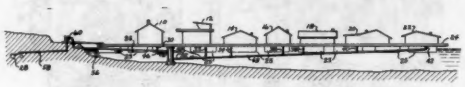
MARINE SEWAGE COLLECTION AND DISCHARGE SYSTEMS

Kenneth F. Kennedy, 3200 Portage Bay Place East, Seattle, Wash.

Filed Sept. 15, 1970, Ser. No. 72,429

Int. Cl. E03f *5/00*

U.S. Cl. 210—121 **16 Claims**



Liquid and solid waste from houseboat dwellings, ships and boats moored to and nearby stationary or floating docks at both fresh and salt water locations is collected and transferred to a sewer system ashore for treatment. This waterfront sewage collection and discharge system is essentially supported and held in place by docks and floats so it is not effected by water level changes caused by tides and waves.

From the outlets of house boats, ships and boats, sewage is directed through flexible couplings and collection pipes, arranged on grade, into partially submerged holding tanks. Each tank is equipped with pumping apparatus to periodically discharge sewage into pipes leading to a sewage system ashore.

Holding tanks are preferably comprised of several like units singly lowered away into the water and sealed together during their convenient installation. Often sewer pipe sections are used as these holding tank units. When docks and floats are changeable in elevation and sufficiently strong, holding tanks are suspended from them. When docks and floats remain essentially at the same elevation, holding tanks may be positioned on the bottom below or nearby them. Plastic pipes are often used and must be held underwater by restraining means to overcome their bouyancy. Expansion and contraction of component assemblies caused by water motion and temperature changes are always compensated for by flexibly joining some members together.

3,703,961

ROTARY BIOLOGICAL FLOW-THROUGH FILTER

Robert Feuer, Laurelton, N.Y., assignor to Aqua Treatment Industries, Inc., Valley Stream, N.Y.

Filed Feb. 18, 1970, Ser. No. 12,353

Int. Cl. B01d *33/06*

U.S. Cl. 210—151 **11 Claims**

Secondary treatment for comminuted, screened or clarified sewage. The sewage is supplied to a filter assembly consisting of a rotating pair of flanges, one blank and one perforated, with arcuately shaped filter elements sandwiched between the flanges. By providing a large surface area for the filters and

making them of a material to which slime will adhere, biological treatment is obtained. Further, the assembly rotates in the

atmosphere providing air without aeration equipment enhancing the aerobic biological purification process.

3,703,962

SECURED PLASTICIZED ACETYLATED CELLULOSE HOLLOW FIBER MEMBRANES

Paul G. Schrader, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 736,012, June 11, 1968, Pat. No. 3,619,459. This application Sept. 16, 1970, Ser. No. 72,886

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **6 Claims**

An improved method for potting plasticized, acetylated cellulose hollow fibers with a thermosettable resin is disclosed wherein an improved bond between the cured resin and the fiber results when the resin comprises a mixture of the following components: a polyglyoidyl ether of a polyhydric phenol, a reactive diluent, a polycarboxylic acid anhydride, a bond promoter, a thixotropic agent and a flexibilizing agent.

3,703,963

SLUDGE HYDROEXTRACTOR

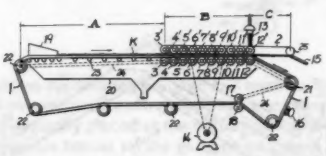
Fusatoshi Eguchi, Fujisawa; Sohei Okamoto, Tokyo-to; Mashio Yamaha, Tokyo-to; Nobuo Matsumoto, Tokyo-to, and Minoru Yokoyama, Tokyo-to, all of Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo-to, Japan

Filed July 20, 1970, Ser. No. 56,572

Claims priority, application Japan, July 24, 1969, 44/58535; Oct. 29, 1969, 44/102755; Aug. 21, 1969, 44/79603

Int. Cl. B01d *33/04*

U.S. Cl. 210—386 **9 Claims**



An apparatus for effecting separation of solids from liquids by repetititve utilization of capillary action provided by a water-absorptive sponge or other like medium, in which a material to be dewatered is fed in uniform thickness on a travelling-endless-water-absorptive sponge belt so that when said material passes a concentration zone, the water in said material is sucked up by the sponge belt so as to increase solid concentration in said material, and then when the belt passes a hydroextraction zone where opposed groups of press rolls are provided, repeated expansion and contraction of the sponge is conducted between the sponge belt and a water-impervious endless belt opposed thereto by means of said roll system, and finally in the scraping zone the dewatered cake is scraped off.

3,703,964

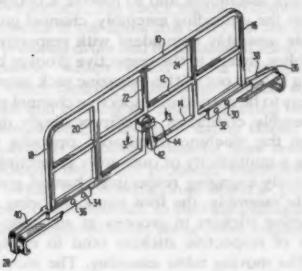
SHELF DIVIDER STRUCTURE WITH LOOP AND COLLAR ARRANGEMENT

Frank P. Field, 122 Eucalyptus Drive, El Segundo, Calif.

Filed Aug. 4, 1970, Ser. No. 60,852

Int. Cl. A47f *5/00*

U.S. Cl. 211—184 **4 Claims**



A shelf divider comprising a flexible resilient material. A base portion of the shelf divider is integrally formed with a U-shaped section. The legs of the U-shaped section may be resiliently spread so that the longitudinal extent of the base portion is increased by applying tensile force thereto. A collar member may be provided to fit over the U-shaped section of the base portion. The U-shaped section may be tapered along the extension thereof so that the fit between the collar and the U-shaped section becomes tighter as the collar is moved along the U-shaped section toward the base portion. Clamping means may be provided on the base portion of the shelf divider for engagement with a shelf upon the longitudinal contraction thereof in response to the movement of the collar along the U-shaped section.

3,703,965

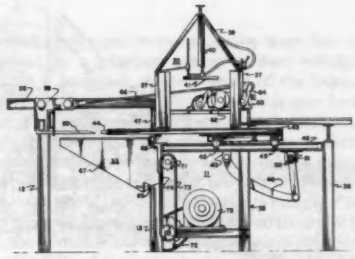
COMBINATION LUMBER STACKER, STICKER PLACER AND UNLOADER

Jesse C. Coats, P.O. Box 167, Horse Shoe Bend, Idaho

Filed March 8, 1971, Ser. No. 121,661

Int. Cl. B65g *57/26*

U.S. Cl. 214—6 M **5 Claims**



The apparatus of the present invention may be categorized into four assembly groups, namely an unstacker assembly, a sticker placer assembly, a lumber stacker assembly, and an unloading elevator assembly. The unstacker assembly is juxtapositioned to the sticker placer and stacker assemblies perpendicularly at right angles to the sticker placer and assemblies with respect to their directions of travel. The unstacker assembly of this invention comprises a framework having an endless chain carried thereby, a hopper on the forwardmost discharge end of the conveyor, the forwardmost wall of which is distally disposed above the conveyor to provide an opening

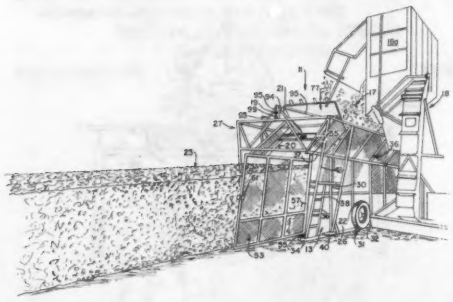
operable to provide an exitway for only one course of lumber in a stack placed rectilinearly on the conveyor with respect to the direction of travel of the conveyor, a guide bar mounted on the conveyor endless chain being operable to urge the lowermost course of lumber in the stack through the exitway. The sticker placer assembly comprises a multiplicity of sticker magazine rack assemblies having open upper and lower ends being operable to carry a plurality of stickers in a stack, moving table assembly being operable to be reciprocatingly driven under the rack assemblies and to receive a course of lumber thereon from the unloading assembly, channel grooves in the moving table assembly coincident with respective magazine rack assemblies, means in the respective grooves being operable to urge a sticker out of the magazine rack assembly and to cause stickers to be carried in respective channel grooves. The stacker assembly comprises a reciprocatingly driven frame mounted on the machine framework opposite the moving table having a multiplicity of outwardly projecting foot members operatively engaging respective channel grooves of the moving table assembly, the foot members being operable to raise respective stickers in grooves at an angle so that the raised ends of respective stickers tend to engage adjacent boards on the moving table assembly. The moving table assembly and stacker assembly are opposingly driven to form a bi-parting support for respective stickers and lumber on the moving table assembly. When the moving table assembly and the stacker are opposingly driven lumber in engagement with sticker ends raised by the stacker assembly tends to be supported by the stickers while lumber not in engagement with respective stickers in the channel grooves tends to be carried by the table. Hence the lumber is caused to be spaced apart. At the terminal limits of travel of the respective assemblies the stickers carrying the spaced lumber are dropped onto the unloading elevator assembly. The elevator assembly comprises a multiplicity of support members mounted on the frame being operable to be moved upwardly and downwardly with respect to the sticker placer and stacker assemblies.

3,703,966

SEED COTTON STACKING APPARATUS

Joseph Kennedy Jones, Raleigh, N.C., and Milton Louis Smith, Lubbock, Tex., assignors to Cotton, Incorporated, New York, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,326
Int. Cl. B65g *57/00*
U.S. Cl. 214—9 **15 Claims**



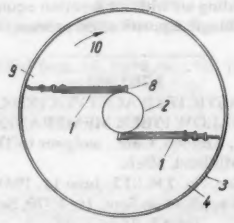
A seed cotton stacking apparatus with a mechanical compressor means pivotally attached adjacent the rear end of a slip form. The open top - open bottom slip form has upwardly extending side walls and a front end wall which define a cotton receiving zone. The side walls include outwardly flared, upper portions. The compressor means includes a crop contacting platen which has a generally planar central portion and downwardly sloping edge portions. The slip form is supported on longitudinally extending skids which are in ground contact during the rick forming process. A selectively operable wheel assembly is included to pivot a pair of wheels downwardly thereby lifting the slip form to a transport position from a skid position.

3,703,967

ROTOR ARM FOR SILO DISCHARGING DEVICES

Hans Gessler, Aalen, Germany, assignor to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung, Wasseralfingen/Wurtt., Germany

Filed Jan. 13, 1971, Ser. No. 106,039
Claims priority, application Austria, Jan. 13, 1970, A 282/70
U.S. Cl. 214—17 D **20 Claims**



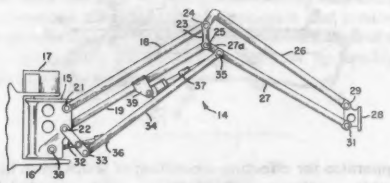
A rotor arm for connection to the motor of silo discharging devices with a packet of spring leaves which in their longitudinal direction are slidably held together by holding means while pressure exerting means exert upon those surfaces of said spring leaves which slidably engage each other a pressure slidably holding said spring leaves together over those sections which are located in front and behind said holding means.

3,703,968

LINEAR LINKAGE MANIPULATOR ARM

Richard W. Uhrich, and Jimmy L. Held, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 20, 1971, Ser. No. 181,786
Int. Cl. B25j *3/00*
U.S. Cl. 214—147 T **8 Claims**



A manipulator arm comprises two parallelogram linkages in combination with a trapezium linkage. The three linkage systems cooperate to produce movement in spherical coordinates when used in conjunction with three independent actuators. The two parallelogram linkages preserve spacial coordination between the wrist, elbow and shoulder joints and the trapezium linkage permits radial extension of objects carried thereby.

3,703,969

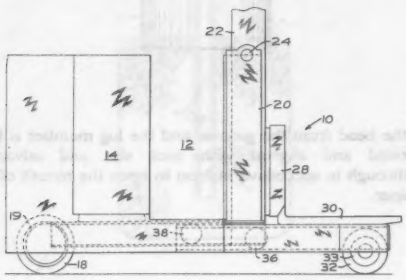
PROCESS OF PLACING A HEAD IN A SPACE WITH A LIFT TRUCK

Walter M. Shaffer, Chesterland, and John T. Crawford, Lyndhurst, both of Ohio, assignors to Towmotor Corporation, Cleveland, Ohio

Division of Ser. No. 822,843, April 14, 1969, Pat. No. 3,616,953. This application June 21, 1971, Ser. No. 155,322

Int. Cl. B66f *9/20;* B65g *1/04*

U.S. Cl. 214—152 4 Claims



A narrow-aisle lift truck with a wheelbase which can be varied by hydraulic cylinders operable to extend and retract movable arms upon which are mounted non-steerable wheels.

3,703,970

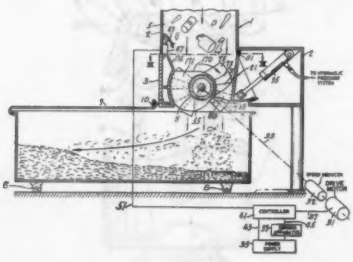
APPARATUS FOR TREATING WASTE MATERIAL

Russell Richard Benson, North Vancouver, Canada, assignor to Benson Industries Limited, North Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 46,700, June 16, 1970, abandoned. This application Feb. 23, 1971, Ser. No. 117,892

Int. Cl. B02c *13/09*

U.S. Cl. 241—241 9 Claims



An apparatus for treating garbage and trash so that it may be reduced to compact form in bags, blocks or otherwise. The apparatus is typically placed at the bottom of a garbage chute and the apparatus breaks up the garbage into small pieces by means of a rotatable low speed high-torque motor-driven breaking drum running in cooperation with a matching anvil. The breaking drum has several rows of teeth which mesh with teeth-like anvil elements of the anvil, and the teeth on the breaking drum are so gapped as to provide a nip to trap and crush oversize bottles and the like. There are two torque-overload features. One torque-overload feature is an electrical overload device which can stop the rotation of the breaking drum if there is a jam, and carry out the cycle of reversing the drum, moving it forward again, and repeating the aforesaid a predetermined number of times and shutting off the machine after any predetermined number of cycles if the jam has not then been cleared. A second torque-overload feature involves moveable mounting of the anvil such that it can move away from operative position in the event of a jam. The anvil is normally held in operative position by hydraulic means and in the event of an overload the hydraulic means permits the anvil to move away from operative position and restores the anvil to its initial position when the jam is cleared. The apparatus also provides a check means in the form of a series of parallel check plates rigidly mounted on the frame of the apparatus. Each check plate is perforated so that it surrounds the breaking drum. Part of each check plate facing the breaking drum has an abrasive surface. The check means in combination with the other elements of the apparatus carry out the functions of clearing the breaking drum and its associated teeth of material adhering thereto which could cause clogging of the mechanism, which clearing of the drum includes scraping the breaking drum and grinding off tightly adhering material particularly material which may have strong fibers; the check means also prevents processed material from returning "upstream" and directs the flow of processed material into the bin or container so that the breaking drum exerts a "pumping" action on the processed material, so that the processed material may be tightly compacted in the bin or other container.

3,703,971

APPARATUS FOR FEEDING ROD-LIKE ARTICLES SUCH AS CIGARETTES

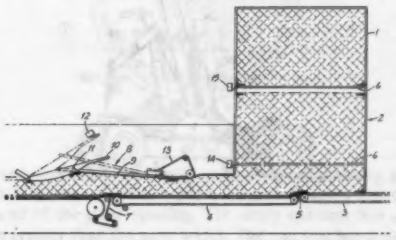
Tom Rowlands, London, England, assignor to Molins Limited, Deptford, London, England

Filed Oct. 2, 1969, Ser. No. 863,271

Claims priority, application Great Britain, Oct. 9, 1968, 47,822/68

Int. Cl. B65f *3/02*

U.S. Cl. 214—302 10 Claims



Cigarettes discharged from successive trays into a hopper, and lowered by a platform which is then withdrawn, are received on a conveyor at the bottom of the hopper which feeds them out of the hopper. To facilitate proper feeding, this conveyor is stopped while the platform is withdrawn, raised, and repositioned to receive further cigarettes. A further conveyor outside the hopper moves continuously, at relatively low speed; while cigarettes are being fed out of the hopper at a relatively high speed, some are stored in a reservoir which expands to receive excess, and when the feed from the hopper is stopped, the continuously moving conveyor is able to maintain a continuous flow of cigarettes by drawing from the reservoir.

3,703,972

BALE WAGON

Lawrence J. Muldoon, 1044 West Elm Street, Lancaster, Wis.

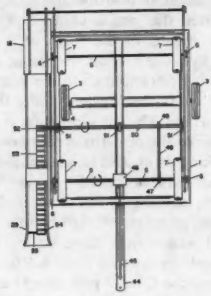
Filed Aug. 27, 1971, Ser. No. 175,627

Int. Cl. B60p *1/42*

U.S. Cl. 214—519 7 Claims

A self-loading and unloading wagon for transporting bales of hay or straw which consists essentially of a rotatably mounted drum having helically arranged internal partitions

which define at least one continuous helical bale-receiving channel extending from one end of the drum to the other. The



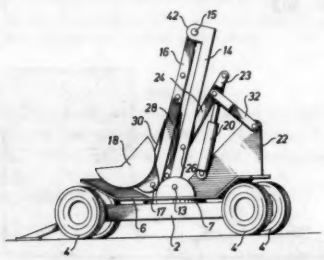
drum can be associated with automatic bale-loading and bale-discharging means and can also be used for handling and mixing dry feed.

3,703,973

MACHINE TO BE USED AS A CRANE, LOADER AND/OR EXCAVATOR

Gustav Lennart Nilsson, 122 32 Enskede, Stockholmsvagen, Sweden

Filed Dec. 11, 1970, Ser. No. 97,110
Int. Cl. B66f *9/00*
U.S. Cl. 214—778 **16 Claims**



A crane loader or excavator having first and second booms pivoted end to end, plus an auxiliary boom connected intermediate its ends to an intermediate portion of said first boom. Hydraulic cylinders are connected at one end of the auxiliary boom to said second boom and at the other end of the auxiliary boom to the base vehicle and an arm pivotally connected at each end to the auxiliary boom and the base vehicle.

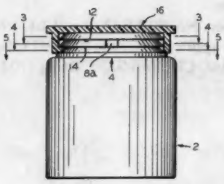
3,703,974

SAFETY CAP

Leo M. Boxer, Village of Whitefish Bay, and Robert W. Boxer, Village of Fox Point, both of Wis., assignors to James D. Pauls; Robert R. Burton; Warren M. Menaker; James Smith; Owen J. Ooms and Eli C. Frank, part interest to each

Continuation-in-part of Ser. No. 881,656, Dec. 3, 1969, abandoned. This application March 8, 1971, Ser. No. 121,821
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **10 Claims**

A safety cap and container combination is provided wherein the container mouth includes a plurality of spaced ribs or flanges each having a differently located notched-out passageway over which a cap member having at least one projecting internal lug is positioned in a single movement to close the container. In one form of the invention, a bead at the rim of the container mouth may be provided to mate with an internal groove in the cap member to seal tightly the cap member to the container. In order to remove the cap member, the cap member is moved partially away from the container to disengage the bead from the groove, and the lug member is then positioned and aligned with each slot and advanced therethrough in successive fashion to open the mouth of the container.

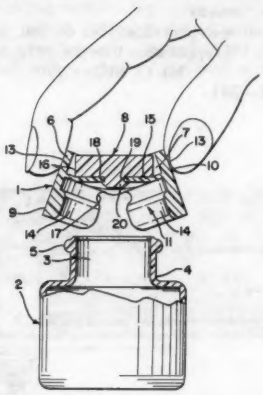


3,703,975

SAFETY CLOSURE

William C. Wittemer, 20102 Clare Avenue, Maple Heights, Ohio

Continuation-in-part of Ser. No. 807,326, March 14, 1969, abandoned. This application June 19, 1970, Ser. No. 47,869
Int. Cl. B65d *21/00*
U.S. Cl. 215—9 **37 Claims**



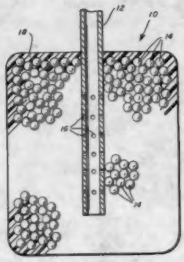
A safety closure consisting of a container and a cap comprising a core and flexible deformable base having a downwardly opening chamber enclosing the container mouth and an upwardly opening chamber to receive the core; the core is moveable relative to the core receiving chamber between a lock position interfering with certain inward deformation of the base, and an unlock position not interfering with such inward deformation of the base; when the core is in the unlock position, the base may be deformed inwardly to retract certain radial projections on the base from corresponding radial recessions in the container to permit removal of the base from the container — such projections, when fitted in said recessions, normally prevent removal of the base; and, in one embodiment, the base having one upwardly inclined surface defining the inner surface which, when pressure is applied to the outside of the base adjacent such surface, tends to force the core upwardly out of the base; and, in other embodiments, various other core designs requiring different core removal.

3,703,976

HIGH PRESSURE STORAGE VESSEL

William L. Hughes; Hansel J. Allison, and Ramachandra G. Ramakumar, all of Stillwater, Okla., assignors to Oklahoma State University, Stillwater, Okla.

Filed Oct. 28, 1970, Ser. No. 84,771
Int. Cl. B65d 25/00
U.S. Cl. 220—3 5 Claims



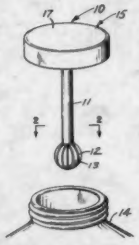
A method of manufacture of a high pressure gas storage vessel having a body of particles in the form of a porous solid mass, a conduit having one end within the porous solid body, the conduit extending from the body providing means of conducting gas to and from the body, and an impervious covering encapsulating the body.

3,703,977

COTTON EXTRACTOR

Bernadette M. Pisarek, 811 Main Street, East Pittsburgh, Pa.

Filed April 14, 1971, Ser. No. 133,891
Int. Cl. B65h 3/22
U.S. Cl. 221—213 1 Claim



A device for removing cotton from containers, the device including a shaft with a serrated ball for gripping the cotton so to remove it from the container.

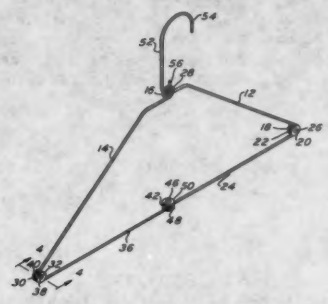
3,703,978

COLLAPSIBLE GARMENT HANGER

Michael Sammartino, 1727 West Passyunk Avenue, Philadelphia, Pa., and Edward E. Reese, Stokes and Spring Road, Indian Mills, N.J.

Filed Feb. 11, 1971, Ser. No. 114,566
Int. Cl. A47j 51/11
U.S. Cl. 223—89 4 Claims

A garment hanger which is adapted to hold both a coat and trousers and which is collapsible into a compact unit when not in use so that it may be easily stored or transported.

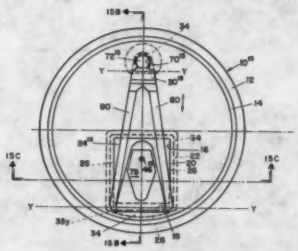


3,703,979

CAN END WITH BONDED SEAL SLIDE

Donald L. Douty, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation

Division of Ser. No. 146,945, May 26, 1971, which is a division of Ser. No. 61,384, Aug. 5, 1970, Pat. No. 3,622,055. This application Jan. 28, 1972, Ser. No. 221,599
Int. Cl. B65d 47/10
U.S. Cl. 222—484 45 Claims



A can end is provided with a pour opening having a pour width. The pour opening is provided with an entry aperture at one end of the pour opening. The entry aperture has a slide width greater than the pour width. The can end has a can end lapping portion and a can end sealing portion adjacent the pour opening and a plane of bulge strength adjacent the entry aperture. A slide is adapted to pass through the entry aperture and has a slide lapping portion and a slide sealing portion. The slide lapping portion is adapted to register with the can end lapping portion, and the slide sealing portion is adapted to register with the plane of bulge strength. A pull tab has a connection to the slide. Engaging means engage the can end lapping portion to press the can end lapping portion into intimate contact with the slide lapping portion and the slide sealing portion into intimate contact with the plane of bulge strength. A pressure barrier material is employed for sealing the intimately contacting can end sealing portion and the slide lapping portion and also for sealing the intimately contacting plane of bulge strength and the slide sealing portion. The pressure barrier material is bonded to the can end sealing portion with the first predetermined shear strength and to the slide lapping portion and to the plane of bulge strength with a second predetermined shear strength less than the first predetermined shear strength. The pull tab is operable to move the slide lapping portion away from the can end lapping portion to break the bond between the slide lapping portion and the pressure barrier material adjacent the can end sealing portion so that the pressure barrier material adjacent the can end sealing portion now functions as an exit and reclosure

slide guide. The pull tab is simultaneously operable to move the slide sealing portion away from such plane of bulge strength to break the bond between the pressure barrier material adjacent the plane of bulge strength and the slide sealing portion so that the pressure barrier material adjacent the plane of bulge strength acts as a guide to uncover the pour opening.

ERRATUM

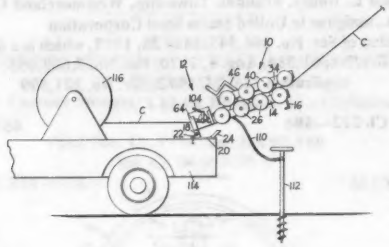
For Class 223—89 see:
Patent No. 3,703,978

3,703,980

TENSION BRAKE ASSEMBLY FOR STRINGING CONDUCTORS

William L. Bright, 0605 S.W. Curry Street, Portland, Oreg.

Filed Aug. 12, 1970, Ser. No. 63,105
Int. Cl. B65h *59/06*
U.S. Cl. 226—90 **10 Claims**



A brake assembly employing a plurality of upper and lower friction sheaves having edge aligned overlapping relationship for frictionally gripping a conductor therebetween. A fair-lead housing is mounted on the infeed end of the brake assembly and employs a horizontal axis guide roller with which the conductor is in engagement forward of the infeed end for feeding to the brake assembly. The guide roller is supported for a combined vertical and longitudinal adjustment relative to the infeed end of the brake assembly for varying the angle at which the conductor engages the first friction sheave in the brake means. Such roller is supported on a hinged carrier capable of being swung outwardly, whereby to displace the roller from the housing for the purpose of laying a conductor flatwise into the fair-lead housing for subsequent engagement with the brake means. The fair-lead housing also has at least one pair of upright rollers providing longitudinal guiding of the conductor through the fair-lead housing, and a top opening is provided in the housing between these rollers so that a conductor can be laid flatwise in the housing. Hinged plate means engage the upper end of the upright guide rollers in one position thereof to connect them to the fair-lead housing and in another position to be out of the plane of the top opening. The fair-lead housing and other conductor engaging means therein are formed of electrically conductive material and are arranged to be connected to a ground line for electrically grounding the conductor.

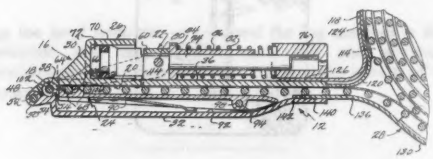
3,703,981

MECHANISM FOR CONTAINING A NAIL PACKAGE AND FEEDING SUCCESSIVE NAILS THEREFROM

George M. Smith, Pawcatuck, Conn., assignor to Textron Inc., Providence, R.I.

Filed March 18, 1971, Ser. No. 125,772
Int. Cl. B25c *1/00*
U.S. Cl. 227—136 **14 Claims**

A mechanism for containing a fastener package and for feeding successive fasteners from the package into a position to be driven by a fastener driving element during the drive stroke thereof, the fastener package being in the form of a coil of circular headed nails flexibly interconnected in series with their shanks in spaced parallel relation, the mechanism including a nose piece assembly defining an elongated drive track receiving the fastener driving element therein during the operating cycle thereof, and a nail feeding track communicating laterally with the drive track, a ratchet type feeding mechanism for feeding successive nails within the nail feeding track into the drive track, and a magazine assembly for containing the coil of the fastener package, the feeding mechanism including a nail feeding pawl carried by an actuating member movable through a return stroke by a fluid pressure actuated piston and through a drive stroke by a spring assembly which also serves to bias the feeding pawl into its nail feeding position, and a pivoted spring pressed holding pawl



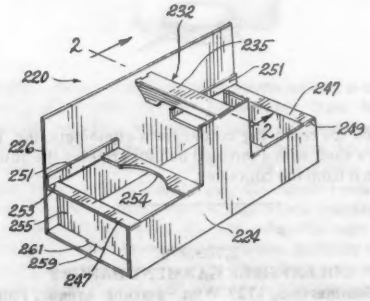
provided with surfaces for substantially laterally closing the drive track at the position of communication with the nail feeding track substantially throughout the longitudinal extent thereof so as to prevent successive nails in the drive track from being canted into the nail feeding track during the driving movements thereof by the fastener driving element, the nose piece and magazine assemblies both being of two-part construction movable between an opened loading position and a closed releasably latched operative position, the magazine assembly including a non-adjustable container suitable to support nail packages of different nail sizes, there being provided nail head camming surfaces between the nose piece and magazine assemblies which insure movement of the nails from the container into the nail feeding track in proper nail head guided relation irrespective of the vertical position of the nail heads within the container due to the length of the nail shanks.

3,703,982

CARRIERS FOR CUPS, SANDWICHES AND THE LIKE

Wallace B. Daughtry, 715 West Elm Street, Arlington Heights, Ill.

Division of Ser. No. 673,712, Oct. 9, 1967, Pat. No. 3,517,868.
This application June 10, 1970, Ser. No. 45,013
Int. Cl. B65d *5/46, 5/48*
U.S. Cl. 229—28 **4 Claims**



A carrier is disclosed, made of foldable material, such as corrugated cardboard, solid fiberboard, paperboard, molded pulp, or various solid or foamed plastics, or laminates of these or other materials, for example, and comprising a bottom wall, first and second end walls extending upwardly from said bot-

tom wall, and a handle extending between said first and second end walls, said handle having a horizontal panel and downwardly folded stiffening flanges thereon. In certain embodiments, the handle is folded from the upper portion of one end wall and is adapted to extend through an opening in the other end wall. The handle and the opening are preferably triangular in shape. Locking means are preferably provided to retain the handle in the opening. The carrier comprises one or more intermediate panels folded from said first end wall and secured to said second end wall, the intermediate panels preferably being formed with openings to receive cups or the like. Vertical flanges are preferably folded downwardly from said intermediate panels to provide rigidity. Locking tabs are preferably provided between the vertical flanges and the bottom wall. A space for sandwiches or the like is preferably provided between the intermediate panels.

3,703,983

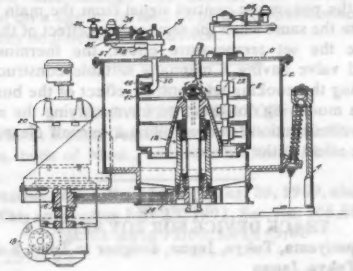
METHOD AND APPARATUS FOR CENTRIFUGING FLUID MIXTURES AND SELECTIVELY REMOVING LIQUID MATERIAL THEREFROM

David M. Tholl, Cumberland, R.I., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Continuation-in-part of Ser. Nos. 856,786, Sept. 10, 1969, abandoned, and Ser. No. 63,439, Aug. 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 856,786,. This application Jan. 28, 1971, Ser. No. 110,391

Int. Cl. B04b *11/00*

U.S. Cl. 233—19 A **22 Claims**



A fluid mixture is received in a basket and rotated at high speed to form centrifugally separated inner and outer masses of material. Planing surface means is supported within the basket in normally spaced relation to the said inner mass of material. An actuating device forces the planing surface means radially outwardly against the resistance to displacement of the inner mass of material as it revolves. The actuating device is controlled to move the planing surface means radially outwardly under a substantially constant pressure which may be regulated to differentiate between resistance to displacement of the outer mass and resistance to displacement of the inner mass. The extent of travel of the planing surface means may, by means of the regulated pressure, be limited to the boundary region or interface occurring between the inner and outer masses of material. A fluid skimming tube has its tip adjustably supported in the planing surface means in slightly recessed relation such that the fluid portion of the inner mass is progressively removed as the planing surface means is travelled outwardly. When the planing surface means finds the outer mass of centrifuged material, outward travel stops and no further removal of material takes place. Pressure changes occurring when removal of material stops are utilized to control return of the planing surface means to a starting position.

3,703,984

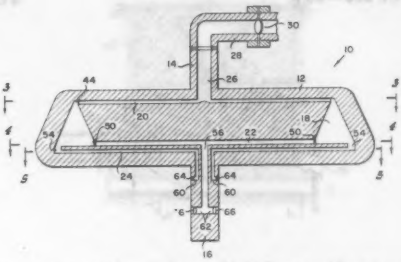
METHOD AND APPARATUS OF CENTRIFUGAL SEPARATION

Harold T. Pruessner, 6015 Rutherglenn, Houston, Tex.

Filed April 21, 1970, Ser. No. 30,533

Int. Cl. B04b *1/00*

U.S. Cl. 233—28 **18 Claims**



The method is employed to separate components of a solution having unlike specific gravities and includes subjecting the solution to a centrifugal force in a range from 150,000 times the force of gravity or above for a time sufficient to permit the occurrence of substantial equilibrium between solution components. These components are physically separated while the centrifugal force employed to cause separation is maintained.

The centrifuge head employed to accomplish the separation of the solution constitutes a solid metallic disc having an annular separation chamber internally formed adjacent the periphery thereof. An inflow network and two outflow networks formed at different levels in the disc join the separation chamber to the central portion of the disc.

3,703,985

TAXIMETER ARRANGEMENTS

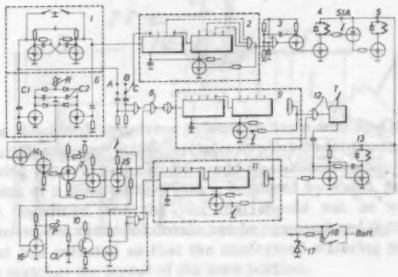
Kjell Willy Berg, Tyreso, Sweden, assignor to Haldex Aktiebolag, Halmstad, Sweden

Filed Aug. 2, 1971, Ser. No. 168,215

Claims priority, application Sweden, Aug. 7, 1970, 10874/70

Int. Cl. G07b *13/10*

U.S. Cl. 235—30 R **2 Claims**

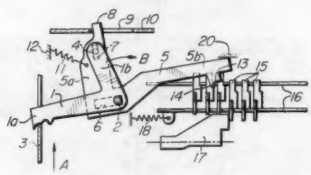


An electronic taximeter comprises a time reference pulse source, a distance travelled pulse source, a time measuring circuit, a level detector, a gate circuit and a fare indicator. When the vehicle is stopped or is running below a selected speed pulses are supplied by the time reference pulse source to actuate the fare indicator while any pulses from the distance travelled pulse source are blocked by the gate. When the vehicle is running at a speed higher than the selected speed, as determined by the time measuring circuit and level detector, the gate is opened so that pulses from the distance travelled pulse source are admitted to the fare indicator and the time reference pulse source is disabled.

3,703,986
SETTING CARRIAGE RETURN MECHANISM

Gian Piero Barozzi, and Giancarlo Horeschi, both of Crema, Italy, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1971, Ser. No. 105,275
Claims priority, application Italy, Feb. 11, 1970, 20472-A/70
Int. Cl. G06c 29/00
U.S. Cl. 235—60 R 4 Claims

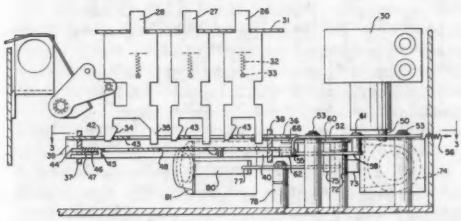


A device for the step-by-step motion of a setting carriage of a calculating machine operated in the course of a division operation. A first bell crank is mounted on a stationary shaft for rotation by a rod for operating the machine. The shaft loosely extends through an elongated slot in a second bell crank having one arm operably connected to a swingable arm of the first bell crank and connected by a tension spring to a machine frame and another arm swingable into engagement with one of stops on the carriage. The spring biases the second bell crank so that the latter, when actuated by said first bell crank, is first rotated about the stationary shaft until said another arm engages and depresses one of the stops and then is moved linearly to shift the carriage a step.

3,703,987
KEYBOARD LOCKING DEVICE

Kazuhiko Ikeda, Tokyo, Japan, assignor to The National Cash Register Company, Dayton, Ohio

Filed Sept. 1, 1971, Ser. No. 177,005
Int. Cl. G06c 25/00; G07g 1/00
U.S. Cl. 235—26 13 Claims

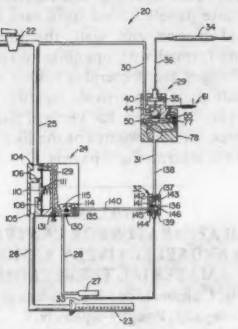


A control mechanism in a keyboard of a data terminal device in which a key lock, when manually rotated in one direction, will selectively lock out one of a number of control keys on a keyboard, and when rotated in the opposite direction, will selectively lock out others of the remaining control keys. Both lock out conditions are released by the energizing of a solenoid at the end of a machine operation. A second solenoid energized upon the initiation of a machine operation locks the control keys in their operated position during the machine operation.

3,703,988
OVEN CONTROL SYSTEM

Charles D. Branson, Greensburg, and Francis S. Genbauffe, Irwin, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 30, 1970, Ser. No. 93,540
Int. Cl. F23n 5/02
U.S. Cl. 236—15 A 16 Claims

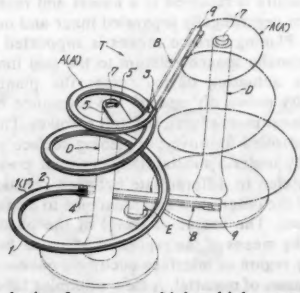


A fuel control system for an oven having a source of fuel and main burner means. A pneumatically operated main valve is utilized for interconnecting the source to the burner when the main valve is actuated and for disconnecting the source from the main burner when the main valve is deactuated. A manually settable and thermostatically operated valve is provided for interconnecting a pneumatic control signal to the main valve to actuate the same when a temperature effect of the burner is below a set temperature effect and for disconnecting the pneumatic control signal from the main valve to deactuate the same when the temperature effect of the burner is above the set temperature effect, the thermostatically operated valve having a manually settable construction for controlling the cooking temperature effect of the burner and having a modifying construction for modifying the manually settable construction for controlling a burnoff cleaning temperature effect of the burner.

3,703,989
TRACK DEVICE FOR TOY VEHICLE

Eijiro Tomiyama, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed May 28, 1970, Ser. No. 41,398
Int. Cl. A63h 19/30
U.S. Cl. 238—10 E 8 Claims



A track device for a toy vehicle which comprises a spiral track member having inner and outer ends to which other track members can be joined to form a track assembly such as a continuous track and being so constructed as to be axially extensible and to be mounted on a support at its portion adjacent the inner end so that by mounting it on the support an axially spirally extended course of travel for the vehicle can be formed.

3,703,990

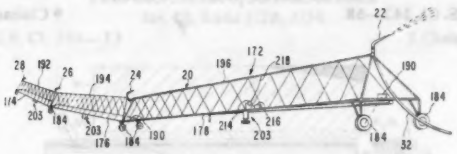
SPRINKLER IRRIGATION APPARATUS AND METHOD

Lennart G. Erickson, 2075 Pioneer Court, San Mateo, Calif.

Continuation-in-part of Ser. No. 767,955, Oct. 16, 1968, Pat. No. 3,610,531, and a continuation-in-part of Ser. No. 815,596, April 14, 1969, Pat. No. 3,578,244. This application March 18, 1971, Ser. No. 125,656

Int. Cl. B05b *3/18*

U.S. Cl. 239—11 35 Claims



Apparatus and a method for sprinkler irrigation wherein a lateral for conveying water has a number of sprinkler heads at spaced locations along the same. Means is provided to cycle the fluid control valves for the heads so that the latter will deliver water in a sprinkling pattern intermittently. One form of the apparatus includes a flexible hose for connecting the lateral to any one of a number of hydrants along the length of a water main. This apparatus permits a relatively long field to be irrigated substantially uniformly in a given period of time. Another embodiment of the apparatus utilizes a flexible, self-emptying hose for connecting the lateral to a single source of water. The lateral can be supported from beneath by retractable means when it delivers water and it can be drained after waterflow therethrough has ceased. The lateral can be mounted on a carrier formed of pivotally interconnected unit which may be independently driven.

3,703,991

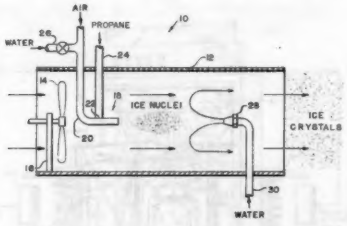
SNOW PRECIPITATOR

William E. C. Eustis, Cambridge, and Wallace E. Howell, Lexington, both of Mass., assignors to Hedco, Inc., Bedford, Mass.

Continuation of Ser. No. 854,103, Aug. 29, 1969, abandoned. This application July 23, 1971, Ser. No. 165,688

Int. Cl. A01g *15/00*; E01h *13/00*

U.S. Cl. 239—2 S 14 Claims



In a snow-making machine which includes a tunnel-like housing, ice nuclei are generated by homogeneous nucleation in a separate zone or part of the air stream within the housing by injecting propane or other refrigerants into a stream of moist air. A propeller at one end of the tunnel moves an air mass through the tunnel carrying the ice nuclei with it. Water slightly above its freezing temperature is discharged through a nozzle disposed in the tunnel and is broken up into droplets. The droplets are discharged in a direction countercurrent to the flow of the air mass and ice nuclei. The air mass supercools the droplets, and they are then infected with the ice nuclei. The ice-infected droplets are then dispersed through a large volume of air to effect the removal of latent heat from the drops to form snow-like particles.

3,703,992

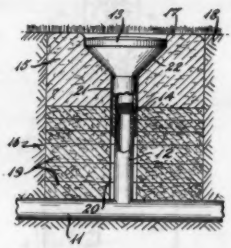
SPRINKLER HEAD PROTECTOR

Lloyd Merryweather, 7160 N.E. 8th Drive, Boca Raton, Fla.

Filed March 17, 1971, Ser. No. 125,150

Int. Cl. A01g *25/06*

U.S. Cl. 239—201 4 Claims



A ground inserted multi-layer shield for providing a protective barrier around a fluid broadcasting head wherein the shield is adjustable to various thicknesses and may be made from lightweight material. The shield is constructed of a plurality of members stacked one upon another to achieve a desired overall stack height or thickness.

3,703,993

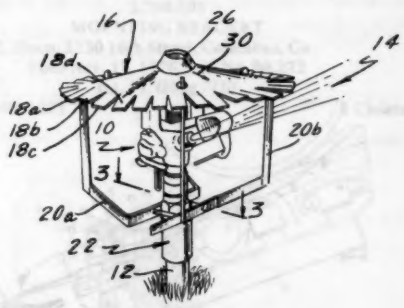
SPRINKLER DEFLECTOR

James W. Schreiner, 2439 Markham Avenue, Thousand Oaks, Calif.

Filed Sept. 23, 1970, Ser. No. 74,580

Int. Cl. B05b *3/08*

U.S. Cl. 239—231 6 Claims



The disclosed apparatus relates to lawn-watering equipment, and more particularly relates to a device for producing a watering pattern that can be made to conform to the shape and size of a lawn portion that is bordered by walks, parking areas, buildings, and the like that should not be wetted. Moreover, the disclosed device can be removed and then reinstalled and oriented so that the conformed watering pattern again matches the layout of the lawn portion.

3,703,994

ADJUSTABLE SPRAY RATE ACTUATOR

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

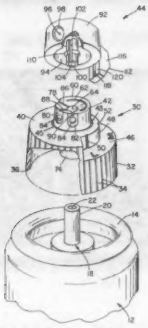
Filed July 6, 1971, Ser. No. 159,947

Int. Cl. B05b *1/26*

U.S. Cl. 239—397 23 Claims

An adjustable spray rate actuator for a pressurized dispensing package includes a base member having a passage coupled to the dispensing valve, a transverse upper surface and a plurality of grooves extending radially outward from the

passage. A cooperating cap member has a stem which is snap fitted into the passage, a discharge port in the stem, a transverse surface that mates with the transverse surface of the base member, and a discharge orifice aligned with the



discharge port. Rotation of the cap member relative to the base member changes the spray rate as a function of the dimensions of the groove aligned with the discharge port and discharge orifice.

3,703,995

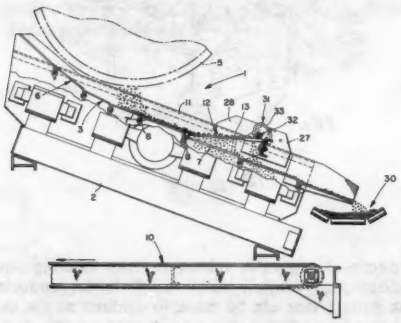
SCREENING APPARATUS

Paul G. Sullivan; Kenneth H. MacLeod, and Joseph E. Kempa, all of Iron Mountain, Mich., assignors to The Hanna Mining Company, Cleveland, Ohio

Filed March 16, 1971, Ser. No. 124,849

Int. Cl. B02c *1/00, 19/16*

U.S. Cl. 241—69 **16 Claims**



Screening apparatus includes a main screen deck having a second screen deck attached to the upper surface thereof intermediate its length. The openings in the second screen deck are larger than the openings in the main screen deck for screening out oversize material and allowing the sized material to fall through for normal treatment on the main screen deck. The oversize material is retained on the second screen deck until the vibrations of the second screen deck or a supplemental breaker mechanism breaks or pulverizes the oversize material to a size which allows such material to fall through the second screen deck and main screen deck for recirculation back through a balling apparatus.

ERRATUM

For Class 241—241 see:
Patent No. 3,703,970

3,703,996

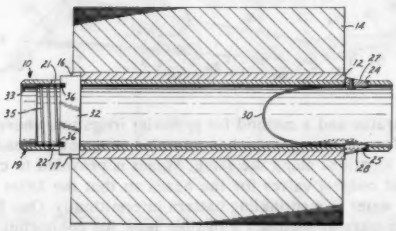
CORED ROLL ARBOR

John W. Ulseth, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed March 1, 1971, Ser. No. 122,562

Int. Cl. B65h *19/02;* **A47k** *10/22*

U.S. Cl. 242—68 **9 Claims**



An arbor for supporting a roll of sheet material wound on a hollow core having axial slots formed in one end thereof. The arbor comprises a cylinder slidably fitting into the roll core and supporting axially movable keys rotatable with the cylinder and biased to fit into the core end slots to positively couple the roll core to the arbor for rotation therewith. Axially stationary and radially biased wedges are supported by the cylinder and abut the opposite end of the core to restrict axial movement of the roll core and maintain the keys in the core end slots.

3,703,997

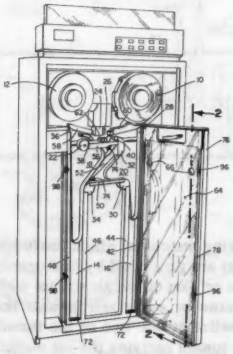
DOOR CONSTRUCTION IN A MAGNETIC TAPE DRIVE SYSTEM

August P. Epina, Boulder, and Paul O. Pearson, Longmont, both of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

Filed June 25, 1971, Ser. No. 156,618

Int. Cl. G11b *15/58, 23/12*

U.S. Cl. 242—182 **15 Claims**



The vacuum buffer zone of a computer magnetic tape drive unit is covered by a door having two parallel plates of glass. By channeling acoustical noise generated by the unit into a chamber formed between the glass plates through openings in the inner glass plate, a substantial reduction in noise is achieved. In addition, the openings permit the chamber to be

evacuated before the tape is drawn down into the buffer zone. As the chamber is evacuated, the atmosphere forces the outer glass plate and the door frame against the inner glass plate which then forms a vacuum tight seal between the inner glass plate and guide members in the buffer zone.

3,703,998

DRONE AIRCRAFT WITH TELESCOPIC FUSELAGE

Peter F. Girard, La Mesa, Calif., assignor to Teledyne Ryan Aeronautical Company, San Diego, Calif.

Filed Dec. 28, 1970, Ser. No. 101,558
Int. Cl. B64c *1/28, 3/56*
U.S. Cl. 244—13 **5 Claims**

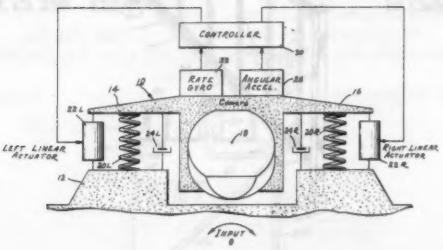
A drone type aircraft having a telescopic fuselage and folding aerodynamic surfaces to facilitate installation in a limited capacity bomb bay or storage compartment of a launch aircraft. Prior to launch, the drone is lowered from the aircraft on a supporting frame, the aerodynamic surfaces are extended, and the nose section of the fuselage is extended. The added fuselage capacity is used as fuel tankage, which is filled from the launch aircraft to increase the operating range of the drone.

3,703,999

WIDE BAND STABILIZER

Edward Louis Forys, Pasadena; Leroy A. Lofftus, Glendale; Richard Milton Malueg, Glendora, and Albert F. Montalbano, Alhambra, all of Calif., assignors to Actron Industries, Inc.

Filed Dec. 12, 1969, Ser. No. 884,404
Int. Cl. G03b *17/56*
U.S. Cl. 248—20 **25 Claims**



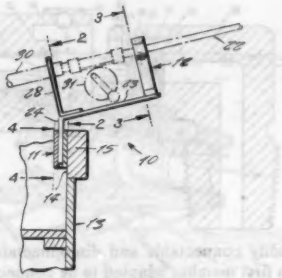
For use in a system in which only translational motions of apparatus are acceptable, an apparatus stabilizing combination is disclosed which utilizes rotational motion sensors in combination with active, linear actuators to correct and compensate for "pitch" and "roll" forces. The suspension system includes the parallel combination of a low stiffness spring isolator with an active, linear motion device.

3,704,000

FISHING ROD HOLDER

Elmer F. Nelson, and Olive Nelson, both of 155 W. 4th South, Provo, Utah

Filed Oct. 28, 1970, Ser. No. 84,574
Int. Cl. A01k *97/10*
U.S. Cl. 248—42 **3 Claims**



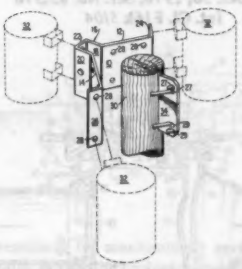
A device for readily supporting a fishing rod outwardly of a boat so to allow free movement of a fisherman in the boat, the device including a mounting bracket fixedly securable to the boat, the mounting bracket removably receiving a pole holder upon which the fishing pole is placed.

3,704,001

MOUNTING BRACKET

Clifford E. Sloop, 2230 10th Street, Columbus, Ga.

Filed Nov. 17, 1970, Ser. No. 90,272
Int. Cl. H02g *7/20*
U.S. Cl. 248—221 **6 Claims**



A mounting bracket for supporting electrical power transformers in clusters of three is disclosed. A first embodiment of the invention comprises a one piece, substantially V-shaped bracket adapted to be mounted to a utility pole and configured to support transformers at the ends of each of its legs and at its vertex. The bracket may be mounted either by direct bolting to a pole, or by use of an island plate abutting a pole and fastened to the legs of the bracket. A second embodiment of the invention may be secured to a pole in the same manner, is also substantially V-shaped, but is assembled of several parts. This embodiment permits angular adjustment of the transformer mounting positions.

3,704,002

DISCONNECTABLE COUPLINGS

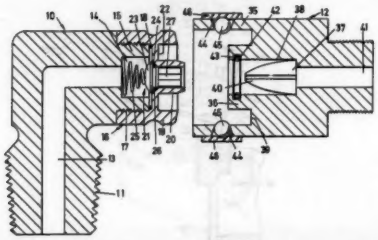
Maciej Stanislaw Skarzynski, 296 Kingston Road, Wimbledon Chase, London, England

Filed Aug. 11, 1971, Ser. No. 170,918

Claims priority, application Great Britain, Aug. 14, 1970, 39,267/70

Int. Cl. F16k 29/00; F16l 37/28

U.S. Cl. 251—149.6 6 Claims



A readily connectable and disconnectable coupling comprising a first member adapted to be connected to a source of fluid under pressure and a second member adapted to be connected to a fluid consuming or control unit, one of the members having a flow control valve urged towards a seat in the fluid flow passageway by resilient means whilst the other coupling member is provided with a valve actuating member and fluid sealing means, the members being coupled together by abutment members associated with one member each engaging a groove formation in th other member, groove formations being such that initial axial movement followed by a partial rotative movement between the two members causes the sealing means to effect a fluid-tight seal with said passageway and further axial movement followed by a partial rotative movement causes the valve actuating member to engage and open said valve.

3,704,003

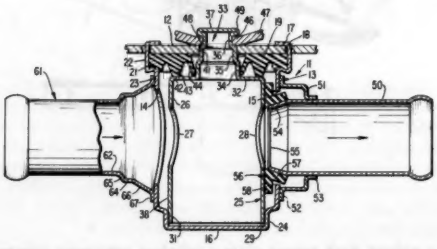
VALVE ASSEMBLY WITH INTEGRAL INLET TUBE AND SADDLE

Robert M. Harter, Collins, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,570

Int. Cl. F16k 5/04

U.S. Cl. 251—312 1 Claim



A fabricated plug valve assembly comprises a valve body having lateral inlet and outlet openings and a hollow ported plug rotatably mounted within the body between valve open and closed positions where it respectively blocks or permits fluid flow from the inlet opening to the outlet opening. An outlet tube is secured to the body around the outlet opening with its inner end mounting an annular seal engaging the periphery of the rotatable plug, and a tubular inlet unit having at its inner end an integral saddle section terminating in a flange shaped to conform to the body side contour is rigidly secured to the body around the inlet opening.

3,704,004

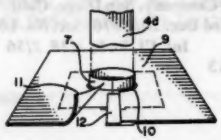
GROUND COLLAR

William J. Carter, Jr., 4700 La Vista Road, Tucker, Ga.

Filed Dec. 16, 1970, Ser. No. 98,703

Int. Cl. E04h 17/00

U.S. Cl. 256—1 5 Claims



For enveloping upright elements such as posts of various cross-sectional configurations at ground level so as to inhibit the growth of vegetation, a collar is formed of flexible, water-resistant sheet material and a main opening is formed therein from which a slit extends to the outer edge of the sheet of material, the slit being for the purpose of facilitating envelopment of a post and the like at ground level. A flange is formed integrally with the sheet and is disposed about the opening formed therein and the opening and flange are configured so as to envelop closely the post or other similar element.

3,704,005

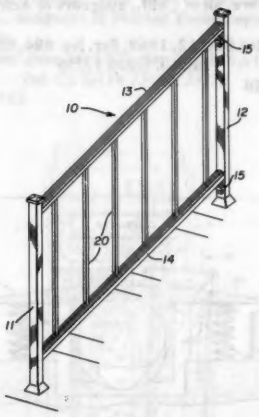
TUBULAR SPINDLE HAVING DEFORMABLE FLATTENED ENDS

Edward J. Kusel, Akron, Ohio, assignor to Questor Corporation, Toledo, Ohio

Filed May 27, 1971, Ser. No. 147,538

Int. Cl. E04h 17/16

U.S. Cl. 256—22 3 Claims



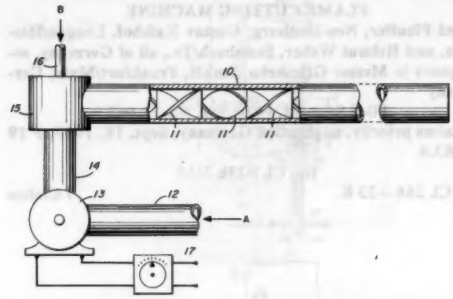
A tube-type spindle for use with ornamental metal railings that is characterized by a unique flattening procedure utilized to make the ends of said tubing readily deformable when associated with the usual parallel top and bottom railings of a metal railing section. This controlled deformability allows the same railing to adjust for slopes required of stair railings. The flattened arrangement includes a first step of crimping on a transverse angle, followed by flattening so as to achieve a laminated structure having a width equal to the width of the tubing.

3,704,006

DISPERSION PRODUCING METHOD

Kenneth M. Grout, Topsfield, and Richard D. Devellian, Rockport, both of Mass., assignors to Kenics Corporation, Danvers, Mass.

Filed Jan. 25, 1971, Ser. No. 109,467
Int. Cl. B01f 5/00, 15/02
U.S. Cl. 259—4 5 Claims



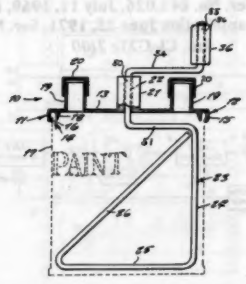
A method for producing a dispersion of a dispersed phase in a continuous phase fluid in which the dispersed phase is immiscible. The method is performed in a system which includes a conduit containing a plurality of sheet-like elements extending longitudinally within the conduit. Each element is curved to turn the direction of fluid flowing past it. The elements are arranged in alternating right- and left- handed curvature groups (a group consisting of one or more elements). The two phases are injected into the conduit and pumped through it at predetermined velocity, which together with the density of the continuous phase, the interfacial tension between the phases and the inner diameter of the conduit determines the Weber number. The drop production reaches an equilibrium between break up and coalescence at about twelve elements and is well stabilized at 21 elements. The system and method can be used to extract solvents, remove color from or clarify liquids, remove or add heat, or affect mass transfer rates in reactions. It may completely oxidize a contaminant in an effluent, or for example, by dispersing an oxygen containing gas in water in which is disolved Na_2SO_3. Tests on various hydrocarbons dispersed in water are reported.

3,704,007

PAINT CAN AGITATOR AND POURING TOP

Paul T. Kroeger, 3111 Willets Road, Philadelphia, Pa.

Filed July 29, 1970, Ser. No. 59,069
Int. Cl. B01f 7/16
U.S. Cl. 259—122 10 Claims



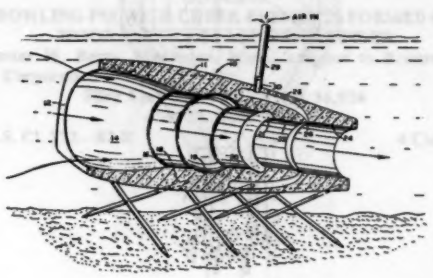
A paint can agitator and pouring top including a removable top having pouring and vent openings diametrically positioned therein and including a central boss to receive a portion of the agitator in rotary engagement therein. The agitator rotates with respect to the top and includes an external crank handle and an internal agitator which is bent to a configuration suitable to mix all of the contents of a paint container.

3,704,008

VACUUM PRODUCING MEANS AND METHOD

Charles Thomas Ziegler, 14242 Victory Boulevard, Van Nuys, Calif.

Division of Ser. No. 804,544, March 5, 1969, Pat. No. 3,550,610, which is a continuation-in-part of Ser. No. 698,958, Jan. 18, 1968, abandoned. This application April 13, 1970, Ser. No. 32,480
Int. Cl. B01f 3/04
U.S. Cl. 261—25 20 Claims



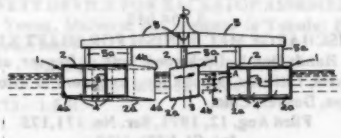
A vacuum producing method and means to be submerged and secured below the surface of a body of flowing water and comprising a casing with converging axial passage means forming a waterway, and an annular channel communicating with and supplying air to a restricted portion of said waterway.

3,704,009

TURBOVENTILATOR FOR THE INPUT OF OXYGEN INTO LIQUIDS

Karl-Heinz Kalbskopf, Oberhausen, Germany, assignor to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 71,046, Sept. 10, 1970, abandoned. This application May 3, 1971, Ser. No. 139,475
Int. Cl. B01f 3/04
U.S. Cl. 261—91 20 Claims

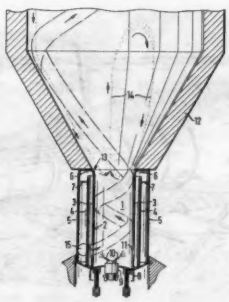


A turbo ventilator for mechanically aerating sewage to activate the sludge during the biological purification is disclosed. A vertical shaft mounts a plurality of circumferentially spaced box-like jet formers which are rotated at the surface of the liquid. These jet formers supply upstanding radially spaced vanes extending between upper and lower enclosure plates to provide short, box-like jet forming tubes. As these jet formers are rotated in the surface layer of the tank, water is taken in a substantially horizontal plane and is accelerated to produce horizontally travelling jets that entrain bubbles of air. These jets are discrete enough and have enough momentum to reach the walls of the tank whereupon they are deflected downwardly to further oxygenate the body of water in the tank. The water is returned to the inlet sides of the jet former tubes from a whirlpool at the center of the tank and makes smooth and nonturbulent transition to a horizontal flow pattern before it re-enters the aerator jet formers.

3,704,010
METHOD AND APPARATUS FOR EXPANDING CLAY GRANULES

Heinz Dennert, Trosdorferweg 6, D-8602 Bischberg, and Hans Veit Dennert, Haus No. 91, D-8602 Schlusselfed, both of Germany

Filed Jan. 28, 1971, Ser. No. 110,551
Claims priority, application Mexico, Jan. 29, 1970, 116946
Int. Cl. F27b *15/10*
U.S. Cl. 263—21 B **6 Claims**

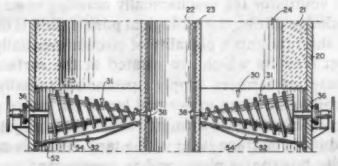


A method and apparatus for expanding clay granules with the steps of producing a hot gas stream in a combustion chamber as an axially streaming, swirling gas stream, introducing the axially streaming, swirling gas stream into a treatment chamber having a narrowing bottom portion as an ascending gas stream which does not fill the entire cross section of the chamber, and introducing a charge of granules into the treatment chamber to be carried along by the ascending gas stream, the granules being permitted to leave the gas stream, fall back under the effect of gravity and recirculate until all of the granules of the charge are completely expanded. The swirling gas stream is tangentially fed into the combustion chamber through slots in the vicinity of the bottom portion thereof, and fuel is atomized into the gas stream by a burner having nozzles and arranged centrally in the combustion chamber at the bottom thereof. The interior of the combustion chamber may be partitioned by two walls, the gas flowing upwardly around one wall and downwardly between the walls before passing into the central area of the combustion chamber.

3,704,011
DISCHARGE MECHANISM FOR SHAFT KILN

John W. Hand; Don L. Lockwood, both of Denver, and Robert K. Harris, Littleton, all of Colo., assignors to Mintech Corporation, Denver, Colo.

Filed Aug. 12, 1971, Ser. No. 171,175
Int. Cl. F27b *1/20*
U.S. Cl. 263—29 **10 Claims**

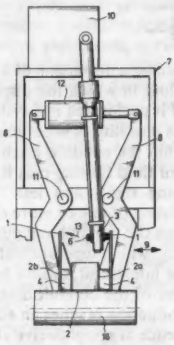


A positive displacement volumetric discharge mechanism of the screw auger conveyor type. A series of radially disposed conical screw type augers and underlying retarder plates substantially close the lower end of an annular chamber of a vertical shaft kiln. The augers are rotated to convey solid materials from a bed of such materials in the kiln chamber radially outwardly to an annular discharge throat. The conical augers are formed so that the volume of material conveyed increases with the radial distance from the center of the kiln in order to maintain a constant and uniform downward flow of solid materials throughout out the cross section of the kiln.

3,704,012
DEVICE FOR POSITIONING A CUTTING TORCH IN A FLAME CUTTING MACHINE

Alfred Pfeuffer, Neu-Isenburg; Gustav Kalkhof, Langen/Hessen, and Helmut Weber, Steinbach/Ts., all of Germany, assignors to Messer Griesheim GmbH, Frankfurt/Main, Germany

Filed Sept. 14, 1970, Ser. No. 72,067
Claims priority, application Germany, Sept. 18, 1969, P 19 47 283.4
Int. Cl. B23k *7/10*
U.S. Cl. 266—23 K **7 Claims**

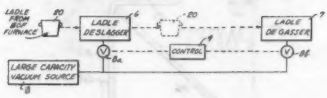


The positioning device comprises an angularly displaceable cutting torch means, stop bars abutting from opposite sides against the workpiece to be separated, and limiting the movement of the torch means. The torch means actuates in its limit positions a torch drive and flame controlling device.

3,704,013
APPARATUS FOR DESLAGGING AND DEGASSING MOLTEN METAL

Thomas E. Perry, Chagrin Falls, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 841,026, July 11, 1969, Pat. No. 3,632,096. This application June 25, 1971, Ser. No. 156,960
Int. Cl. C21c *7/00*
U.S. Cl. 266—13 **1 Claim**

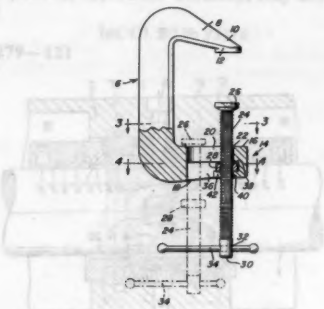


Apparatus for deslagging and degassing molten metal such as steel. Molten steel is prepared in a conventional melting furnace and is tapped into a ladle. A vacuum is applied to the slag on the surface of the steel in the ladle to deslag the steel; the vacuum source may be os such large capacity that it also provides a vacuum environment for a ladle degassing system.

3,704,014
QUICK ADJUSTING C-CLAMP

Robert F. Keene, P.O. Box 58, Cool, Calif.

Filed Feb. 8, 1971, Ser. No. 113,557
Int. Cl. B25b *1/12, 5/10*
U.S. Cl. 269—249 5 Claims

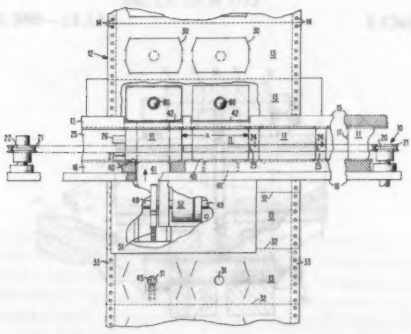


A C-clamp comprising a C-shaped frame embodying a pair of arms having similar ends joined by a bight portion. One of the arms, similar to an ordinary C-clamp, has a terminal anvil constituting a stationary clamping jaw. The other arm has first and second slots to accommodate an elongated screw. This screw has the usual swivelly mounted head on one end adapted to be lined up with and moved toward and from the stationary jaw and it in effect is a movable jaw. A screw mounting and end thrust nut is threaded on the median portion of the screw and is shiftably, adjustably and operatively mounted in one of the slots by way of a nut receiving and keying pocket. A notched wall of the pocket receives and permits the screw to be positioned for adjustment or release for quick manual adjustment of the nut on the screw.

3,704,015
APPARATUS AND METHOD FOR MOUNTING CARDS ON A WEB

Charles Holovka, Jr., Hightstown, N.J.; Bohdan Demchyshyn, Levittown, Pa., and John Francis McHugh, Fords, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed April 5, 1971, Ser. No. 131,196
Int. Cl. B65h *39/00*
U.S. Cl. 270—52 13 Claims



Stiff flexible items, such as plastic credit cards, are inserted within four angled corner slits in respective mailer cards forming part of a burstable continuous form. A ram passes perpendicularly through a circular aperture in each mailer card and forces the credit card against a stationary anvil to bow the central section in a forward direction and concurrently cause the extended ends of the credit card to move rearward into contact with the mailer card to spread the slits. When the ram is retracted, the credit card, due to its inherent resiliency, snaps straight; as it does so, its four corners tuck into the slits around the aperture. Credit cards are mounted one or two to a mailer card automatically as they are advanced intermittently, first transversely of the continuous form to a merge position and then in the same direction as the continuous form to a mounting position.

3,704,016
BOWLING PIN WITH CHEEK ELEMENTS FORMED OF WOOD PARTICLES AND RESIN BINDER

Foster W. Berry, Mushegon, Mich., assignor to Brunswick Corporation

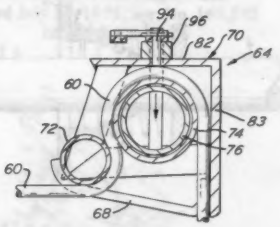
Filed April 24, 1970, Ser. No. 34,924
Int. Cl. A63d *9/00*
U.S. Cl. 273—82 R 4 Claims

A bowling pin structure wherein the cheek portions of the pin are molded to define controlled density wood fiber and binder resin materials secured about a core. The assembly is machined to define the desired bowling pin body configuration. The cheek material is compressed to provide a preselected density distribution to provide high durability and controlled scorability while maintaining the overall weight approximately that of conventional wood pin materials.

3,704,017
SAFETY DEVICE FOR BACKSTOP ASSEMBLY

James L. Young, Malvern, Pa., assignor to Tubular Products, Inc., Souderton, Pa.

Filed Jan. 21, 1970, Ser. No. 4,647
Int. Cl. A63b *63/04*
U.S. Cl. 273—1.5 R 7 Claims

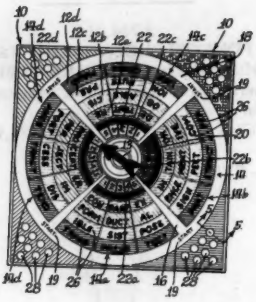


A safety device for a folding basketball backstop which can be actuated in hoisting, lowering or storing of the backstop is disclosed. The safety apparatus includes a safety cable which cooperates with a switch actuated solenoid mechanism for substantially immediately preventing further movement of the backstop upon detection of failure of the main hoisting and lowering cable or the structures associated with the main hoisting and lowering cable.

3,704,018
BOARD GAME APPARATUS

Robert V. Fyanes, 4133 Wagner Avenue, River Forest, Ill.

Filed Dec. 7, 1970, Ser. No. 95,773
Int. Cl. A63f 3/00
U.S. Cl. 273—134 AB 7 Claims

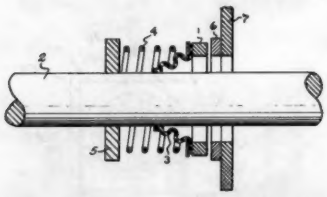


A game board for an educational game for use by a plurality of players and having a playing area arranged in a circle which includes, in one case, syllables or multi-letter portions of words, and in another case, letters, which in both cases are put together to form words, and to change or add to words previously made; the board includes a series of concentric circles in which the various syllables or letters are arranged, the circles being of different colors, the board also includes a spinner, in the center and a series of numbers repeated circumferentially, the several series being of colors corresponding with those of the circles; and playing pieces incorporated in the board but capable of being punched therefrom for use in putting on the places indicated by the spinner to form words of the syllables or letters depicted on those places.

3,704,019
SPIRAL GROOVE FACE SEALS

James D. McHugh, San Jose, Calif., assignor to General Electric Company

Filed June 19, 1970, Ser. No. 47,824
Int. Cl. F16j 15/16, 15/40
U.S. Cl. 277—27 8 Claims

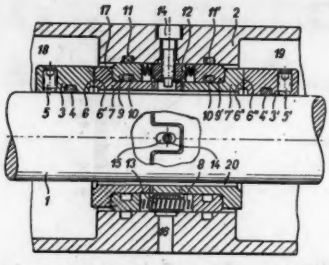


A seal for a rotating shaft which extends between areas containing fluids at different pressures. A spring-biased sealing ring rotates with the shaft and is axially biased against a stationary runner having deep, helical grooves thereon. Fluid from the side of the runner with which the grooves communicate is forced beneath the ring and provides a countervailing pressure against the fluid on the other side of the runner.

3,704,020
DOUBLE ACTING ROTARY MECHANICAL SEAL

Dieter Karl Wilhelm Huhn, Jarpstigen 20, S-161 40 Bromma, Sweden

Filed Dec. 7, 1970, Ser. No. 95,702
Int. Cl. F16j 15/34
U.S. Cl. 277—62 4 Claims

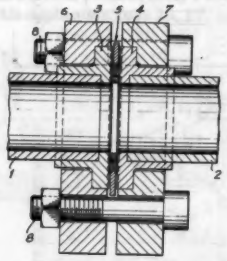


The disclosure herein describes a seal which prevents the entry of a fluid to be sealed from atmospheric into the seal gland should the pressure of the blocking medium fall below that of the fluid. The seal includes an annular piston which is axially displaceable on the seal's sleeve by the pressure of the fluid of the counterforce if the blocking medium should fail; the displacement of the piston allows the fluid to fill an annular space between the piston and the sleeve and to exert a hydrostatic pressure on the sleeve which balances the pressure of the medium and prevent sealing faces between blocking medium and fluid from separating. At the same time, the pressure on the sealing faces between the blocking medium and the atmosphere is also increased.

3,704,021
SEAL ASSEMBLY

Jean-Francois Barbarin, Ruelle, and Jacques Beaumatin, La Montagne, both of France, assignors to Etat Francais, Paris, France

Filed Oct. 15, 1970, Ser. No. 80,931
Claims priority, application France, Oct. 17, 1969, 6935565
Int. Cl. F16j 15/00, 19/02
U.S. Cl. 277—180 7 Claims



A seal assembly comprises an inner ring of plastic material on which a toroidal elastomer is mounted in tension. An outer ring of plastic material is on the elastomer and a rigid metal ring encircles the outer plastic ring. The outer plastic ring has greater thickness than the inner plastic ring and the metal ring.

3,704,022

CHUCK FOR TURNING MACHINES

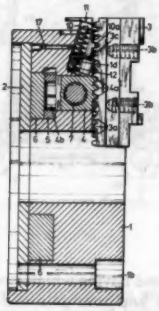
Johann Blattry, Buderich, and Heinrich Beckers, Dulken, both of Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany

Filed May 27, 1971, Ser. No. 147,471

Claims priority, application Germany, May 29, 1970, P 20 26 208.2

Int. Cl. B23b 31/16

U.S. Cl. 279—121 11 Claims



The specification discloses a chuck having radially moveable jaws and driving means for the jaws which disengage from the jaws in outer positions of the jaws. Each jaw has associated therewith a holding member which is engaged with the jaw and moves therewith and prevent the jaws from coming out of the chuck body when disengaged from the driving means. Each holding member is releasable from its jaw by radially inward movement of the jaw and holding member while the jaw is disengaged from the driving means.

3,704,023

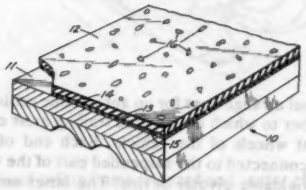
SKI WITH CUT-RESISTANT SURFACE COVERING

Dan Lloyd Downs, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 2, 1970, Ser. No. 77,649

Int. Cl. A63c 5/12

U.S. Cl. 280—11.13 L 6 Claims



Skis and similar structures are provided with a cut-resistant decorative surface layer of urethane resin on a fibrous support. The protective surface layer may be removed and replaced as needed. The ski is protected against marring and scratching and is stabilized against chatter.

3,704,024

BRAKE MECHANISM ATTACHED TO A SKI

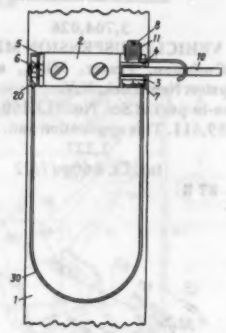
Hans Martin, Volkmarstrasse 6, Zurich, Switzerland

Filed Feb. 8, 1971, Ser. No. 113,211

Claims priority, application Switzerland, Feb. 17, 1970, 2262/70; Jan. 7, 1971, 200/71

Int. Cl. A63c 7/10

U.S. Cl. 280—11.13 B 14 Claims



A brake mechanism adapted to be secured to a ski for braking the ski, comprises at least one brake element movable, upon release of the boot from the ski binding, from a position above the running surface of the ski automatically downwardly into a ski braking position, to thereby engage with the snow for the purpose of exerting a braking force upon the ski. A retaining element actuatable upon inserting the boot into the ski binding retains the braking element in its preparatory braking position, so that upon release of such retaining element the braking element moves from its preparatory braking position into its actual ski braking position. A first locking-pawl arrangement serves to retain the braking element in a locked position for convenient transport and storage of the ski, and a second locking-pawl arrangement serves to retain such braking element in its preparatory braking position, this retaining element cooperating with said first locking-pawl arrangement and said second locking-pawl arrangement such that actuation of said retaining element causes release of the locked position of said braking element and transfer thereof into its preparatory braking position against a spring force effective at said retaining element.

3,704,025

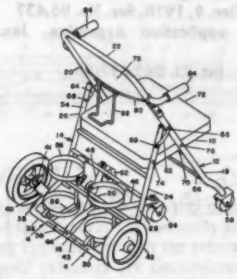
FOLDING CART

Daniel H. Cerveny, 4886 Noyes, San Diego, Calif.; Perry T. Johnson, 5588 Chelsea Street, La Jolla, Calif., and Donald H. Gaston, 3066 McGraw, San Diego, Calif.

Filed July 23, 1971, Ser. No. 165,532

Int. Cl. B62b 1/00

U.S. Cl. 280—41 A 6 Claims



A folding cart that includes a front frame, a rear frame pivotally connected with the front frame, rollers or wheels on

both frames, a seat pivotally attached to both frames for supporting an occupant, and a third frame pivotally attached to the rear frame and movable to a forward position to function as a stabilizer for the cart when the front and rear frames are in partly folded position and is movable to an upright position when the front and rear frames are in completely folded position when the cart is being shipped or stored side by side with other like carts.

3,704,026

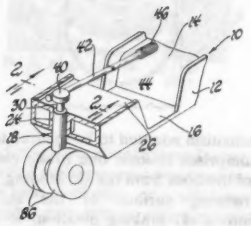
VEHICLE SUSPENSION MEANS

Walton W. Cushman, Fraser, Mich., assignor to Martin Tucker, Trustee, New York, N.Y.

Continuation-in-part of Ser. No. 713,160, March 14, 1968, Pat. No. 3,559,611. This application Jan. 12, 1970, Ser. No. 2,227

Int. Cl. B60g 11/22

U.S. Cl. 280—87 R **12 Claims**



A vehicle suspension includes an outer tubular housing with a plurality of contoured or tapered surfaces formed internally thereof and an internally disposed shaft also provided with a plurality of contoured or tapered surfaces formed externally thereof; a plurality of elastomeric rings are situated between the internal and external tapered surfaces so as to be engageable therewith; the outer housing is carried by the vehicle body section so as to be movable therewith while the extending end of the shaft is connected to associated vehicular running gear such as ground engaging wheels; as the vehicular load is applied, the inner shaft and externally formed tapered surfaces move axially relative to the outer housing and internally formed tapered surfaces thereby progressively resiliently deforming the elastomeric rings therebetween so as to create a controlled spring rate therethrough; a steering tiller is connected through a worm gear and follower gear to the outer housing so as to enable both rotation of the outer housing and running hear relative to the vehicle as well as relative repositioning of the tiller with respect to the outer housing and running gear.

3,704,027

SUSPENSION SYSTEM FOR MOTOR VEHICLES

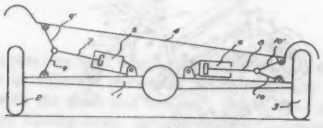
Sanfrancisco Cayetano Roque Laudadio, Sadi Carnot 102, Wilde, Buenos Aires, Argentina

Filed Dec. 9, 1970, Ser. No. 96,437

Claims priority, application Argentina, Jan. 8, 1970, 226.306

Int. Cl. B62d 37/00

U.S. Cl. 280—87 B **2 Claims**



A motor vehicle suspension system that improves the cornering of the vehicle and reduces the tendency for the vehicle to roll over when rounding sharp curves. Lifting devices are interposed between each of the vehicle wheels and the vehicle body. A device responsive to the vehicular steering system actuates the outboard lifting devices when the vehicle is steered into a curve for combating the centrifugal forces that tend to shift the vehicle center of gravity.

3,704,028

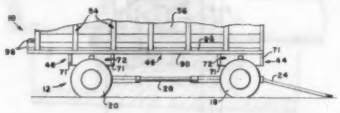
FARM WAGON FRAME

James G. Greiner, Leola, and John E. Breisford, Terre Hill, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed March 22, 1971, Ser. No. 126,745

Int. Cl. B62d 21/00

U.S. Cl. 280—106 T **10 Claims**



A farm wagon frame having a high strength to weight ration and including front and rear axle still assemblies interconnected by side rail members. The side rail members are formed in a specific manner to support wagon stakes in such a manner that they do not project beyond the sides of the vehicle and also to support the wagon floor supports in such a manner that the weight on the floor supports is not transmitted in shear to the axle sill assembly.

3,704,029

REAR WHEEL ARRANGEMENT HAVING TRAILING ARMS FOR AN AUTOMOBILE VEHICLE

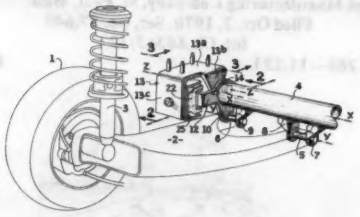
Gilles Bailleux, Sartrouville, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Billancourt, both of France

Filed Nov. 4, 1970, Ser. No. 86,702

Claims priority, application France, Feb. 2, 1970, 7003510

Int. Cl. B60g 7/00

U.S. Cl. 280—124 R **15 Claims**



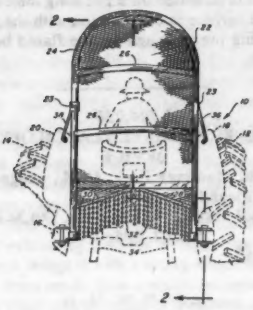
Rear wheel arrangement for an automobile vehicle having a cross-member to which are pivoted trailing arms carrying the independent wheels of the vehicle. Each end of the cross-member is connected to the suspended part of the vehicle by a resiliently yieldable pivotal device. The latter comprises, on one hand, an elastomer sleeve interposed between coaxial members respectively integral with the suspended part and the cross-member, and, on the other hand, two brackets respectively integral with the cross-member and the suspended part and packing means of resiliently yieldable material interposed between and fixed to the brackets. The packing means is offset with respect to the pivot axis of the pivotal device and adapted to work mainly under shear stress.

3,704,030

PROTECTOR SCREEN FOR TRACTOR DRIVERS

Paul E. McFerron, Route 5, Siloam Springs, Ark.

Filed March 2, 1970, Ser. No. 15,418
Int. Cl. B60r 27/00
U.S. Cl. 280—150 R 4 Claims



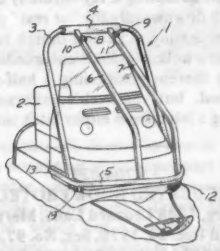
An upper convex protective screen and frame is mounted upon a tractor chassis or axle and includes in combination therewith a plurality of depending chain members which are adapted to allow movement of rear tractor hitch mechanisms yet provide protection to the lower torso of the tractor driver from debris, rocks, etc. thrown by adjacent tractor mounted mowing devices.

3,704,031

PROTECTION APPARATUS FOR A VEHICLE

Howard F. Confer, 116 Chesterfield, Bloomfield Hills, Mich.

Filed April 16, 1970, Ser. No. 29,027
Int. Cl. B60r 19/00
U.S. Cl. 280—150 C 7 Claims



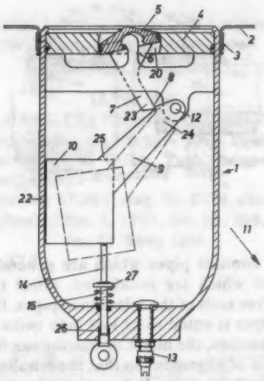
A combined safety bumper guard and cutter elements for a vehicle, such as a snowmobile. A frame consisting of square cross sectioned structural elements is removably mounted on the snowmobile. The frame includes two U-shaped members whose legs are rigidly affixed to each other, and whose central portions are spanned by two substantially oblique structural members each of which has a hardened steel cutter element mounted thereon for cutting or severing wires or other obstacles encountered by the snowmobile when in motion.

3,704,032

ACTUATING MEANS FOR INFLATING A VEHICULAR CRASH-PAD

Ernst Fiala, Berlin, Germany, assignor to Wolf-Dieter Klink, Lindbach, Germany

Filed Nov. 5, 1970, Ser. No. 87,203
Claims priority, application Germany, Nov. 6, 1969, P 19 56 505.0
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 13 Claims



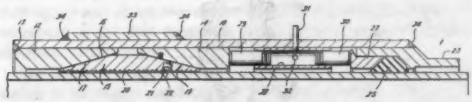
An actuating means for inflating an inflatable crash pad by releasing high pressure from a tank, the crash pad being attached to the tank comprises a means responsive to the speed of the vehicle for releasing the high pressure to fill the inflatable crash pad, the actuating means being located within the tank. An eccentrically connected rotatable release member is provided between the tank and crash pad and is moved from a normally closed position when the vehicle experiences a predetermined amount of deceleration.

3,704,033

CONNECTOR FOR TUBULAR MEMBERS

James F. Arnold, Baytown, Tex., assignor to Hydro Tech Services, Inc., Houston, Tex.

Filed Jan. 15, 1971, Ser. No. 106,854
Int. Cl. F16l 35/00
U.S. Cl. 285—18 7 Claims

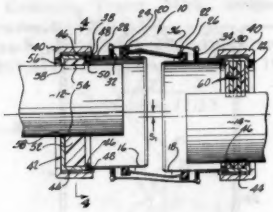


A housing arranged for positioning over the end of a tubular member carries a tapered slip assembly arranged for actuation into gripping engagement with the tubular member. Longitudinally aligned cylinders are circumferentially spaced about within the housing and a piston slidably positioned in each cylinder is arranged to provide actuation force to the slip assembly in response to an hydraulic pressure.

3,704,034
OFFSET CONNECTOR

Harold Shire, Los Angeles, and Ira R. Newman, Lakeview Terrace, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.

Filed July 10, 1970, Ser. No. 53,919
Int. Cl. F16l *11/12*
U.S. Cl. 285—47 18 Claims

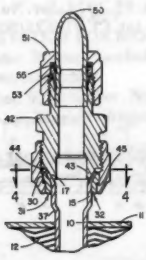


In order to connect pipes which are generally parallel to each other but which are misaligned, offset tubing is connected to the free ends of the misaligned pipes. If the misalignment of the pipes is equal to or less than twice the offsets of the offset connectors, the offset connector can be rotated into at least one axis of alignment so that the misaligned pipes can be connected without stress. If the misalignment of the pipes is greater than twice the offset of the connectors, an intermediate offset connector is connected between the offset connectors to reduce the misalignment and make possible at least one axis of alignment between the pipes. The intermediate offset connector is designed so the misaligned pipes ride on seals inside the connector to permit axial adjustment of the pipes and compensation for thermal expansion of the pipes. In addition, this arrangement provides a limiting pivoting motion of the pipes on the seals for connecting pipes which have some degree of non-axial misalignment.

3,704,035
COUPLING ASSEMBLY FOR REPLACEMENT OF RETURN BEND

Robert H. Mayer, Bridgeport, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,972
Int. Cl. F16l *41/00*
U.S. Cl. 285—157 2 Claims

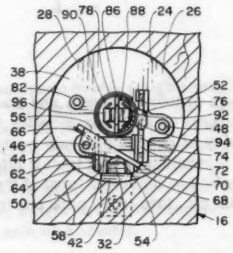


The coupling assembly is employed for attaching a return bend to a heat exchanger tube. The tube is formed with an enlarged or expanded end portion spaced close to the tube sheet and terminating in an outwardly flaring bell. A coupling nut is formed with a shouldered bore having a diameter sufficient to permit the nut to be passed over the flaring bell end of the tube and positioned on the tube sheet. The segments of a two-part split sleeve are formed at one end to provide a conical surface comparable to the flaring bell end of the tube. The conical surface is spaced from opposite ends of the sleeve a distance not greater than the spacing between the tube sheet and the expanded end portion of the tube. The sleeve segments are insertable between the tube and the nut when the same is positioned on the tube sheet. The sleeve segments are formed to provide a shoulder engageable by the shoulder in the nut. The nut is threaded on a coupling member fixed on a return bend and surface in conjunction with the split sleeve to draw the coupling member against the flared bell end of the tube.

3,704,036
THUMB LEVER ACTUATED LATCH OPERATING DEVICE

John R. Gerlach, Monterey Park, Calif., assignor to Emhart Corporation, Bloomfield, Conn.

Filed May 5, 1971, Ser. No. 140,341
Int. Cl. E05c *1/16*
U.S. Cl. 292—167 22 Claims

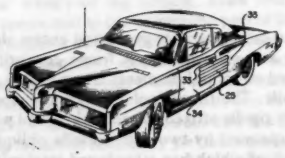


A preferably self-lubricating plastic slide frame is secured on the main frame part straddling the pivotal thumb lever inner end and includes a vertical guide track slidably mounting an actuating yoke downwardly engaged over the thumb lever inner end and upwardly abutting and overlying, pivotal actuating lever. The slide frame also includes a vertical guide track slidably mounting a stepped bar-like slide which downwardly abuts the actuating lever and is upwardly stepped engaged with a crank arm of a rotatable spindle assembly, one of the steps of the slide projecting rearwardly through the slot of a cover for additional guiding thereof. An inverted L-shaped leaf spring is engaged with a side of the slide frame and an underside of the actuating lever normally urging the actuating lever pivotally downwardly for "at rest" positioning of the actuating lever, actuating yoke and thumb lever. The spindle assembly includes a hollow cylindrical spindle retainer having alternate sockets therein positioning a half-round spindle in resiliently retained, but removable, alternate positions for properly engaging a latch from either latch side.

3,704,037
ARTICULATED DOOR PROTECTOR

Bernard Glassberg, 1948 Leonard Lane, Merrick, N.Y.

Filed Dec. 14, 1970, Ser. No. 97,623
Int. Cl. B60j *11/00*; B60r *19/00*; B61f *19/00*
U.S. Cl. 293—1 12 Claims



A car door protector has been improvised which is formed of parts that can be rolled together or can be collapsed into a

compact package adapted for storage when not in use and which can be attached to the keyhole of the car door and suspended from a string that has an enlargement or tongue on the lower end of which that can that can be inserted through a hole in the uppermost slot or portion of the protection member. This attaching member is effective as a hook for the suspension of the protection member. Another form of hook which is detachably connected to the suspension member and adapted to be fitted between the glass and the frame of the door and which has a depending string and T-shaped tongue. The hook can also be an integral part of the upper slat member and folded therewith into the collapsed slat package. The protective member as provided by opposite plastic sheets having a foam rubber filler disposed therebetween and this combination cut alternately to provide hinge joints of the opposite layers to permit the collapse of the slots in an accordian like manner. A protection member can be made of a series of elongated tubes held together by knotted strings and suspended from a hook connected to the uppermost tube. In another form heat sealed plastic sheets containing ribbed or longitudinally extending pockets of foam rubber particles. A key shaped hook integral with a string which in turn is integral with a plastic sheet made from a single stamping and to which a foam rubber sheet can be adhered is provided.

3,704,038

NEGATIVE PRESSURE LIFT DEVICE

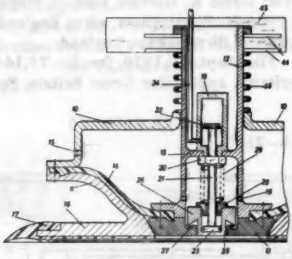
Rudolf Glanemann, Gimbter Weg, Germany, assignor to Paul Eckert, Emsdetten, Germany

Filed July 12, 1971, Ser. No. 161,784

Claims priority, application Germany, July 15, 1970, P 20 35 058.7; Jan. 11, 1971, P 21 00 974.5; March 5, 1971, P 21 10 711.9

Int. Cl. B66c *1/02*

U.S. Cl. 294—65 **14 Claims**



A negative pressure lift device is shown which exhibits a suction cannister consisting of an upper part shaped as a cover and having a center opening to accommodate a piston rod connected to a disk piston, and a funnel-shaped lower part connected thereto, which has a bottom opening to accommodate the disk piston. This device is provided with a sealing membrane affixed, respectively, in the flange-joint between the upper and lower parts and to the disk piston. When the piston rod is lifted a vacuum is created between the membrane, the lower part and the object to be lifted.

3,704,039

TRUCK BED COVER

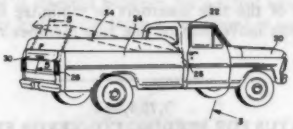
William H. Dean, 1516 E. Griswold, Phoenix, Ariz.

Filed Sept. 14, 1970, Ser. No. 72,052

Int. Cl. B60j *7/10*

U.S. Cl. 296—137 B **14 Claims**

A cover for pickup truck beds, said cover releasably hinged on a horizontal axis to the forward end of a pickup truck bed; and an inverted U-shaped stand pivoted to a rearward portion of said cover and having legs with bearing means slidably operable in tracks secured in generally horizontal disposition at opposite inner sides of said pickup truck bed.



3,704,040

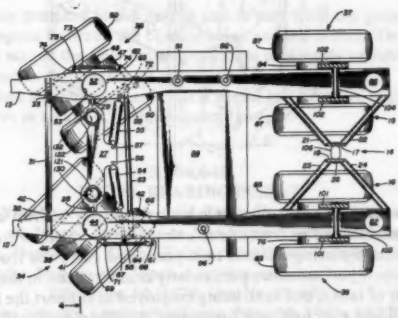
VEHICLE FOR TRAVERSING ROUGH TERRAIN

Leo W. Davis; Marion D. Lackey; John Reuben Ross, and Bryant Trenary, all of Dallas, Tex., assignors to Peerless Mfg. Co., Dallas, Tex.

Division of Ser. No. 67,901, Aug. 28, 1970, abandoned. This application Dec. 6, 1971, Ser. No. 205,111

Int. Cl. B60p *1/04*

U.S. Cl. 298—17 R **12 Claims**



A vehicle for traversing rough terrain, such as is commonly found in open mining operations and highway construction work. The vehicle is characterized by a movable frame structure. The frame includes a pair of elongated side members which are joined in a spaced apart relationship near the rear of the frame members by a first crossmember which is provided with a pivotal joint to permit the side members to rotate or pivot relative to each other. The front ends of the side members are connected by second and third crossmembers, each of which is pivotally connected at both ends to the side members to provide lateral restraint to the side members while the vehicle is traversing rough terrain. The second and third crossmembers are vertically displaced to prevent relative rotation of the side members about their longitudinal axes while permitting up and down movement of the forward ends of the side members as the side members rotate about the pivot point in the first crossmember.

The frame is adapted to support a body, such as a dump box which is pivotally mounted to the side members for pivotal movement about the same axis as the side members. The dump box is maintained in a level position as the vehicle traverses rough terrain by two hydraulic load leveler assemblies which are mounted on the second crossmember and engage the forward end of the dump box. Each side member supports, through suitable suspension means, wheel assemblies at the forward and rearward ends thereof, each of the wheel assemblies being oscillatable about an axis parallel to the path of travel of the vehicle to permit the wheel assemblies to conform to terrain which is inclined relative to the traverse axis of the vehicle.

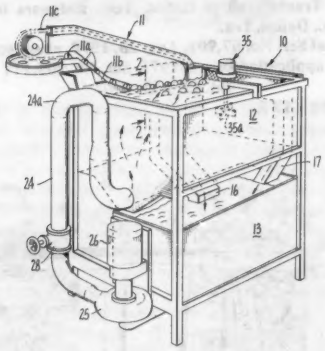
Power for driving the wheel assemblies and powering auxiliary equipment is derived from an engine module mounted on the side members between the wheel assemblies by mounting assemblies which permit movement of the module upon movement of the side members to minimize stresses in the module upon movement of one side member relative to the other.

3,704,041

APPARATUS FOR FEEDING CONVEYOR FROM BULK SUPPLY

Malcolm W. Loveland, Orinda, and Robert J. Singleton, Pittsburg, both of Calif., assignors to Atlas Pacific Engineering Company

Filed Dec. 21, 1970, Ser. No. 100,143
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **9 Claims**



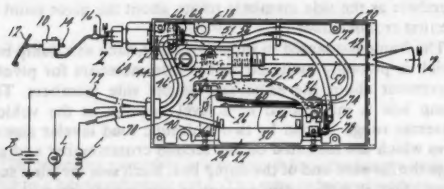
An apparatus for containing a bulk supply of fruit and arranged for feeding fruit one at a time onto a conveyor from the bulk supply using a liquid to support and carry the fruit onto the conveyor and more particularly characterized in the use of a pair of tanks, one tank being employed to support the fruit in liquid and a second tank for storing the liquid displaced by the entry of fruit, said tanks being interconnected by an overflow water passage, a water return having an intake located subjacent to the conveyor, and means for pumping water from the water storage tank back into the fruit containing tank at a point remote from the intake of the water return.

3,704,042

BRAKE CONTROLLER

Edward G. Sturgeon, Orchard Lake, Mich., assignor to Syncro Corporation, Oxford, Mich.

Filed March 2, 1970, Ser. No. 15,773
Int. Cl. B60t *13/70*
U.S. Cl. 303—3 **6 Claims**



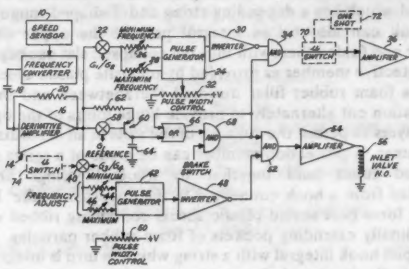
A brake controller for an electric brake which is operated by a hydraulic piston from hydraulic fluid from the main brake system and in which the volume of fluid used from the main system to fully actuate the controller is minimized and is at a volume no greater than around .010 cu. in.

3,704,043

ADAPTIVE BRAKING CONTROL SYSTEM

George B. Hickner; Donald W. Howard, and Paul S. Houseman, all of South Bend, Ind.; Ralph W. Carp, Baltimore, Md., assignors to The Bendix Corporation

Filed Sept. 10, 1970, Ser. No. 70,979
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **7 Claims**



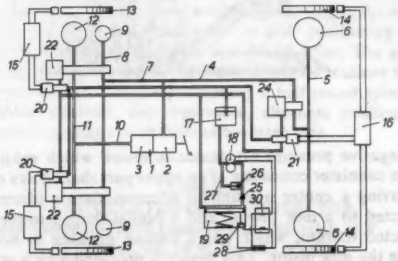
An anti-skid control system for operating inlet and outlet valves of a pressure modulator. The control system uses the rate of change of rotational velocity of the wheels to give an acceleration or deceleration signal. After given acceleration or deceleration rates have been exceeded, the appropriate valve is variably pulsed to give brake pressure build and decay rates that are directly proportioned to wheel acceleration or deceleration. A deceleration responsive switch is used to vary the length of the pressure decay cycle to account for varying coefficients of friction. A delay prevents an initial deceleration rate from operating the valves unless the deceleration rate still exists after a time period.

3,704,044

ACTUATOR ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

Brian Ingram; David A. Harries, both of Warwickshire, and Lancelot Phoenix, Birmingham, all of England, assignors to Girling Limited, Birmingham, England

Filed Sept. 17, 1970, Ser. No. 73,144
Claims priority, application Great Britain, Sept. 17, 1969, 45,705/69
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F **10 Claims**



An actuator assembly for a vehicle hydraulic braking system incorporates at least two chambers each having an inlet for connection to a fluid pressure source and an outlet for connection to a wheel brake. The effective volume of each chamber is adapted to be varied between a minimum and a maximum value by movement of an expander piston working in a bore in communication with that chamber.

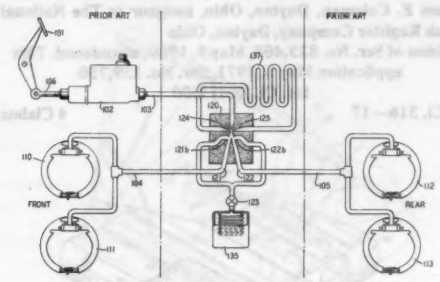
The expander pistons are normally urged in directions in which the effective volumes of the chambers are at their minimum values, and means are incorporated for moving the expander pistons in opposite directions to increase the effective volumes of the chambers progressively when the deceleration of a wheel controlled by a brake supplied with fluid from at least one of the outlets exceeds a predetermined value.

3,704,045

FLUIDICALLY CONTROLLED ANTISKID VEHICLE BRAKE SYSTEM

Edward G. Walsh, Galena, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 14, 1969, Ser. No. 876,824
Int. Cl. B60t *11/10*
U.S. Cl. 303—21 F 1 Claim



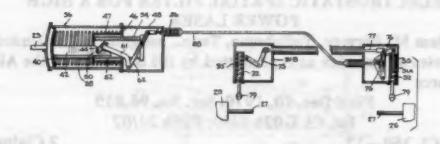
An improved fluid actuated vehicle braking system is disclosed that combines continuous braking action of the vehicle with intermittent braking at the vehicle wheels. Insertion of a fluidic flip-flop between the master cylinder and the wheel cylinders permits alternate application of the front and rear brakes. Depression of the brake pedal results in continuous deceleration of the vehicle since one or the other brake is continuously operated. At the same time, the possibility of the vehicle skidding is minimized by the intermittent braking action at each wheel which prevents "locking" of any wheel.

3,704,046

BRAKING MECHANISM

Robert G. Beacon, Sparta, N.J., assignor to Elicon-National, Inc., Totowa Borough, N.J.

Continuation-in-part of Ser. No. 11,230, Feb. 13, 1970. This application Sept. 25, 1970, Ser. No. 75,447
Int. Cl. B60t *8/22*
U.S. Cl. 303—22 R 8 Claims



A braking mechanism for a railway car including feeler apparatus mounted on each side of a railway car body for indicating movement of the bolster with respect to the truck side frames, load compensating apparatus connected to the brake cylinder pipe for varying pressure of air in the brake cylinder, and equalizer apparatus for receiving vertical movement indications from the feeler apparatus and sending corresponding indications to the load compensating apparatus.

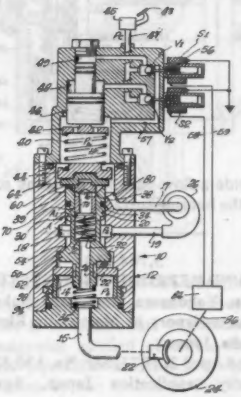
3,704,047

PRESSURE REGULATING VALVE WITH FLOW CONTROL

Gordon W. Yarber, 6070 Ramirez Canyon Road, Malibu, Calif.

Filed April 13, 1970, Ser. No. 27,736
Int. Cl. B60t *15/04*
U.S. Cl. 303—54 8 Claims

The invention provides more gradual and typically more linear response to an abrupt change of command force in a pressure regulating valve, in which the command force is opposed by a hydrostatic force developed from the output pressure and any lack of balance operates a control valve to supply fluid to or from the outlet to reestablish equilibrium. A flow limiting orifice is inserted between the control valve and the output, and the hydrostatic force is developed in part directly from the pressure at the output and in part from the pressure in the space between the control valve and the orifice. The effective size of the flow limiting orifice is preferably variable in response to the degree of opening of the control valve. The described structure is particularly useful in a pressure regulating valve in an antiskid brake control system.



3,704,048

METAL BEARING INSERT

Kengi Yoshikawa, Nagoya, and Etsuo Hayashi, Nishinomiya, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka and Goshi Kaisha Yoshikawa Seimitsu Kohsakusho, Nagoya-shi, Japan, part interest to each

Filed Nov. 10, 1970, Ser. No. 88,430
Claims priority, application Japan, Nov. 10, 1969, 44/89922
Int. Cl. F16c *25/04*
U.S. Cl. 308—72 1 Claim

A metal bearing comprises a thin cylindrical portion having a bearing hole formed at the center, a collar formed concentrically around it, and three radial legs coupled to the cylindrical portion and said collar.

3,704,049

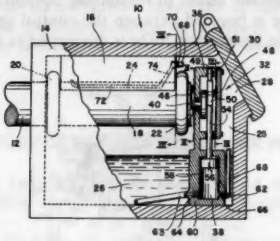
JOURNAL LUBRICATOR

Camillo Guerrini, R. D. 2, Greenville, Pa.

Filed March 26, 1971, Ser. No. 128,268
Int. Cl. B61f *17/24*
U.S. Cl. 308—84 2 Claims

A lubricating device for maintaining a flow of lubricating oil between a journal brass and an axle in a railroad freight car truck. The lubricator includes an eccentric mounted on the

axle end and driving a piston type pump to provide a continuous recirculating flow of oil. The journal brass is ported and



grooved to provide a flow path for oil along substantially the entire length of the bearing surface.

3,704,050

SOUND REPRODUCTION SYSTEM

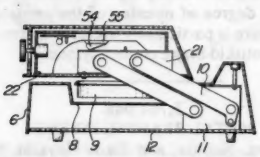
Nobuhiro Nakae, Yokohama, and Toru Nakamura, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed April 2, 1971, Ser. No. 130,629

Claims priority, application Japan, April 17, 1970, 45/37720

Int. Cl. A47b *81/06*

U.S. Cl. 312—7 R **1 Claim**



A sound reproduction system in which a radio receiver is coupled to the top of a record player through a lifting mechanism so that a cover of the record player is eliminated, and in addition, the sound reproduction system is made compact and lightweight as a whole.

3,704,051

CABINET FOR THE HANGING STORAGE OF DRAWINGS, PLANS OR THE LIKE

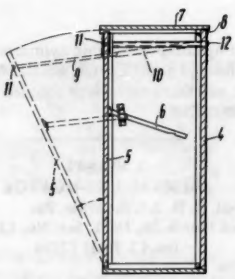
Heinz-Werner Kohler, Meitze, Germany, assignor to Karl Mobus KG Zeichnungs-Ordner, Mellendorf, Germany

Filed Jan. 18, 1971, Ser. No. 107,252

Claims priority, application Germany, Jan. 20, 1970, P 20 02 305.6

Int. Cl. A47b *63/00*

U.S. Cl. 312—184 **4 Claims**



A cabinet for drawings storage has a fall front and support rails mounted between the fall front and the cabinet back. These support rails are pivotally mounted at their ends and additionally supported on fixed discs which bear, about their periphery, support positions at various distances from the axis of rotation of the disc. The support may thus be adjusted by rotation of the disc.

3,704,052

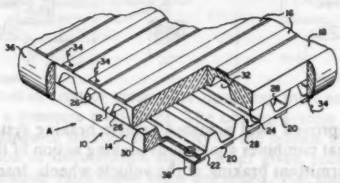
METHOD OF MAKING A PLASMA DISPLAY PANEL

William E. Coleman, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Division of Ser. No. 823,408, May 9, 1969, abandoned. This application May 3, 1971, Ser. No. 139,750

Int. Cl. H01j *9/00*

U.S. Cl. 316—17 **4 Claims**



A plasma display panel comprising first and second transparent substrates, each having a plurality of spaced parallel conductors on a first surface thereof, and a plurality of spaced, parallel grooves in a second, opposed, surface thereof, with the grooves being aligned with associated conductors on the same substrate. The substrates are assembled with their second surfaces together and with the grooves of the first substrate being positioned at an angle to the grooves of the second substrate so as to form cells at crossover points of the grooves. The grooves of the first and second substrates are made by using the associated conductors as masks to produce self-compensated alignment between conductors and grooves. An electroluminescent material is contained within the grooves.

3,704,053

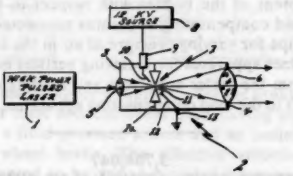
ELECTROSTATIC SPATIAL FILTER FOR A HIGH POWER LASER

William M. Farmer, Tullahoma, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 10, 1970, Ser. No. 96,819

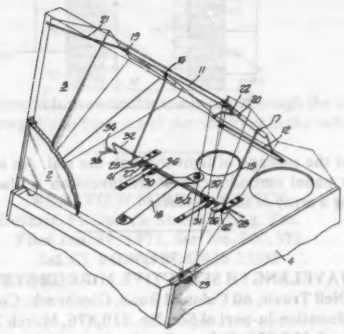
Int. Cl. G02b *9/00*; F25b *21/02*

U.S. Cl. 350—17 **2 Claims**



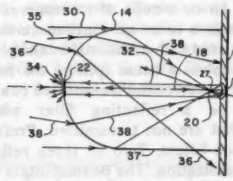
An electrostatically cooled spatial filter for high powered pulsed lasers wherein the filter comprises a first lens which focuses a laser beam on a pinhole, and a second lens positioned behind the pinhole to receive the beam. To prevent the laser beam from destroying the pinhole an electric field is applied across the pinhole. This field cools the pinhole and as a result the size of the pinhole is preserved.

3,704,054
FOLDING MIRROR AND SCREEN ASSEMBLY
Edward Robak, Orange, Calif., assignor to Technicolor, Inc., Hollywood, Calif.
Filed May 14, 1971, Ser. No. 143,446
Int. Cl. G03b 21/56
U.S. Cl. 350—123 14 Claims



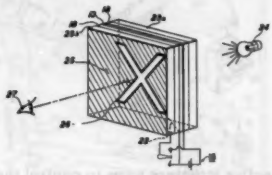
A folding mirror and screen assembly for use with projectors, viewers, or the like is disclosed which includes a mirror unit and screen pivotally mounted on a base means and a support arm pivotally connected to the mirror unit. Latch means are provided on the base means to latch the support arm in upright position when the assembly is in its viewing position. Means are also included to release the latch means so that the assembly may be folded into the closed position.

3,704,055
PROJECTION SCREEN
Sung Kul Hong, Box 642, Fort Wayne Bible College, 1025 W. Rudisill Boulevard, Fort Wayne, Ind.
Filed May 28, 1971, Ser. No. 148,036
Int. Cl. G03b 21/60
U.S. Cl. 350—128 18 Claims



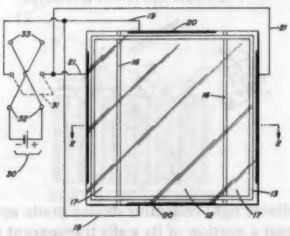
Disclosed is a projection screen for displaying optical images projected thereonto by a projector. The screen is formed from a multiplicity of optical cells juxtaposed to define a surface. Each of the cells is provided with a light converging lens having a predetermined radius of curvature and means disposed adjacent to the focal region of the lens for passing the light rays that are converged by the lens along lines passing through the focal region thereof. A mask means is disposed optically behind the lens for selectively absorbing light rays converged by the lens along lines extending through points laterally offset from the focal region of the lens in a direction perpendicular to an optical axis thereof, and a means is optically aligned with the light passing means for dispersing those light rays passed thereby.

3,704,056
IMAGING SYSTEM
Joseph J. Wysocki, Webster; James E. Adams, Ontario, and Robert W. Madrid, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 867,593, Oct. 20, 1969, Pat. No. 3,642,348. This application Aug. 31, 1971, Ser. No. 176,493
Int. Cl. G02f 1/16
U.S. Cl. 350—150 20 Claims



An imaging system which imagewise transforms a cholesteric liquid crystalline material from its Grandjean or "disturbed" texture state to its focal-conic or "undisturbed" texture state by an imagewise applied electrical field whereby a cholesteric liquid crystalline member is imaged in a desired image configuration by the electrical field-induced texture transition system.

3,704,057
ELECTROCHROMIC DEVICE HAVING IDENTICAL DISPLAY AND COUNTER ELECTRODE MATERIALS
Lindley Clair Beegle, Darien, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed June 2, 1971, Ser. No. 149,301
Int. Cl. G02f 1/36
U.S. Cl. 350—160 6 Claims

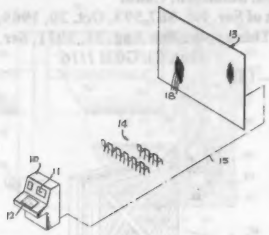


An electro-optical device is provided which is useful in control of visible and infrared absorption by windows, data display devices and the like typically comprising an electrochromic material as the display area, the same type of electrochromic material serving as an electrode for the device.

3,704,058
LIGHT MODULATING DEVICE CONTROLLED BY A DIVERTABLE FLUID STREAM
Sidney Bertram, Los Angeles, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Division of Ser. No. 648,781, June 26, 1967, Pat. No. 3,572,896. This application Oct. 23, 1970, Ser. No. 83,615
Int. Cl. G02f 1/36
U.S. Cl. 350—160 6 Claims

A controllable light reflective device made up of a chamber having at least a portion of its walls transparent to form a window therein with a light reflective structure forming part of or associated with said window. A fluid is placed in the chamber

with structure for controllably displacing the fluid to and from a selected portion of the chamber and in optical cooperation



with the reflective structure so as to control the amount of incident light which is reflected by the device through the window.

3,704,059

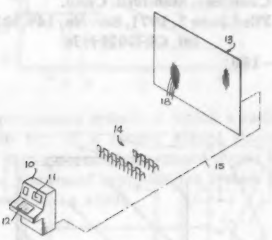
SWITCHABLE LIGHT MODULATING DEVICE

Sidney Bertram, Los Angeles, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 648,781, June 26, 1967, Pat. No. 3,572,896. This application Oct. 23, 1970, Ser. No. 83,616

Int. Cl. G02f *1/36*

U.S. Cl. 350—160 **7 Claims**



A controllable light reflective device made up of a chamber having at least a portion of its walls transparent to form a window therein with a light reflective structure forming part of or associated with said window. A fluid is placed in the chamber with structure for controllably displacing the fluid to and from a selected portion of the chamber and in optical cooperation with the reflective structure so as to control the amount of incident light which is reflected by the device through the window.

3,704,060

ELECTRICALLY CONTROLLABLE LIGHT CONDUCTING DEVICE

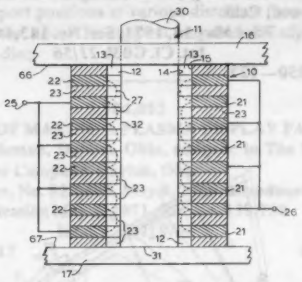
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed Aug. 31, 1971, Ser. No. 176,618

Int. Cl. G02f *1/34, 1/36*

U.S. Cl. 350—160 R **3 Claims**

Specified herein is a device which includes the use of a rod, or a filament, of light conducting material clad in a second light conducting material presenting a lower index of refraction than the core material but which is electrically controllable. The rod and cladding are supported in an electrode assembly by means of which the light conducting characteristics of the cladding is changed as a function of an electric field established by the electrode assembly so as to permit or



prevent the passage of light through the rod. An information display panel embodiment of the invention is also disclosed utilizing a array of such devices.

3,704,061

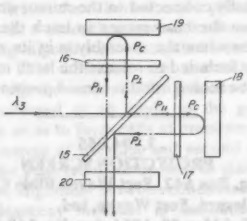
WAVELENGTH SELECTIVE MIRROR SYSTEMS

David Neil Travis, 60 Colonial Road, Glenbrook, Conn.

Continuation-in-part of Ser. No. 810,476, March 26, 1969, Pat. No. 3,527,523. This application March 25, 1970, Ser. No. 22,575

Int. Cl. G02b *27/14, 5/28*

U.S. Cl. 350—171 **3 Claims**



Polychromatic beams are separated into component colors or wavelength bands by wavelength selective filters combined with a beamsplitter. These filters are arranged on three sides of a cubic space, with a beamsplitter on the diagonal. The space may be air or a cube of transparent material, such as glass. If the beam is to be split into more than three colors, a second cube is used with additional beamsplitters. At least one filter which receives a beam split by the beamsplitter, either the filter which receives the transmitted beam or the reflected beam, must be a reflecting filter which reflects the wavelengths that are not transmitted. Preferably such filters are interference filters. Two or three reflecting filters give better energy utilization. The beamsplitters may be chromatic or achromatic. Phase retardation plates compensate to polarization effects. The invention is particularly useful with electrical signal detectors for readouts for coded marks using photoluminescent components forming the code.

3,704,062

REAR VIEW OPTICAL SYSTEM

William W. Toy, Bloomfield Hills, Mich., assignor to Lewis G. Harmon, Birmingham, Mich., a part interest

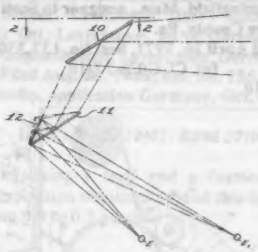
Continuation of Ser. No. 779,922, Nov. 29, 1968, abandoned. This application March 26, 1971, Ser. No. 128,498

Int. Cl. G02b *5/08*

U.S. Cl. 350—301 **12 Claims**

A rear view optical system adaptable to a vehicle having a top wall provided with an opening therein. A first mirror is supported above the opening and is adapted to direct the

image downwardly to a one-way or beam splitter mirror which in turn directs the image forwardly to a second mirror. The



second mirror in turn redirects the image through the one-way mirror rearwardly to the eyes of the observer in the vehicle.

3,704,063

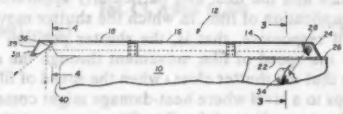
REARVIEW MIRROR DEVICE

Charles I. Guthrie, 51 Guthrie Street, Irving, Tex.

Filed Jan. 18, 1971, Ser. No. 107,371

Int. Cl. B60r *1/06*; G02b *23/02*

U.S. Cl. 350—302 **1 Claim**



A rearview mirror device for panel truck operators enables them to view the "blind spot" behind the truck to prevent accidents and to prevent damage to the rear of the truck when backing up. The device includes a channel running longitudinally along the center of the top exterior of the truck body. An aperture is provided in the operator's compartment of the truck through which a plane mirror is viewable by the operator. The line of sight from the operator extends from the plane mirror rearwardly through the channel to a convex mirror attached to a rear portion of the channel extending beyond the rear of the truck. In the preferred embodiment the convex mirror provides a field of view as wide as the truck which extends backwardly approximately 12 feet from the truck.

3,704,064

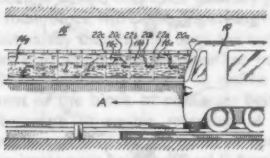
DISPLAY SYSTEM FOR MOVING SUBWAY TRAINS

Nicolas Sollogoub, Outremont, Quebec, and Jean A. Bloc, Montreal, Quebec, both of Canada, assignors to Agence Katimavik Inc., Montreal, Quebec, Canada

Filed Oct. 3, 1968, Ser. No. 764,778

Int. Cl. G03b *25/00*

U.S. Cl. 352—100 **1 Claim**



A display system for moving subway trains in which a plurality of consecutive images are mounted on the wall of the subway tunnel and each image is provided with an electronic flash tube and a photoelectric cell. The illumination from the window of the passing train subsequently energizes each photoelectric cell which in turn energizes the flash tube so as to provide a sequence of animated images for a passenger located by the said window.

3,704,065

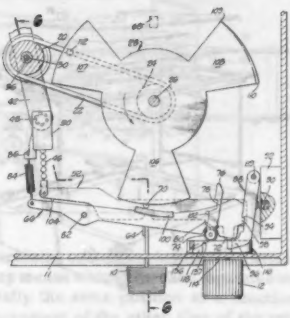
SINGLE FRAME ADVANCE MECHANISM FOR PICTURE PROJECTORS

Alex J. Procop, and Ace Boultinghouse, both of Northridge, Calif., assignors to Edutek Systems Corporation

Filed July 2, 1971, Ser. No. 159,432

Int. Cl. G03b *21/38*

U.S. Cl. 352—169 **9 Claims**



A mechanism for motion picture projectors and the like for advancing a strip of film one frame at a time. A brake mechanism is tripped by a pin located upon one of the rotating shutter blades which then permits the brake to engage another of the shutter blades to stop its movement at a position leaving the shutter open. At the same time the mechanism disengages a clutch drive between the shutter and its drive motor so that the shutter is free running just prior to braking.

3,704,066

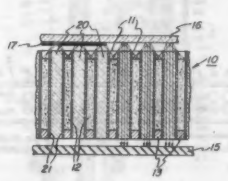
REFLEX EXPOSURE MEDIUM

Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 20, 1970, Ser. No. 82,282

Int. Cl. G03c *1/92*; G03b *27/04*

U.S. Cl. 355—11 **12 Claims**



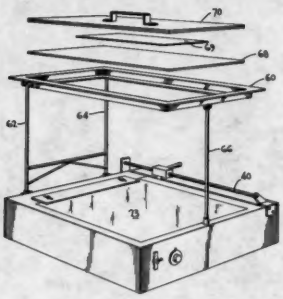
An exposure medium for producing a reflex exposure of an original image onto a photosensitive surface including a transparent conductive member adapted for positioning proximate to the original image to be reproduced. The exposure medium further includes an opaque conductive member spaced from the transparent conductive member and adapted for positioning proximate to the photosensitive surface. A luminescent member is positioned between the transparent conductive member and the opaque conductive member and is adapted when energized to illuminate the original image through the transparent conductive member. A plurality of light conductive members are disposed throughout the opaque conductive member and the luminescent member for conducting patterns of light reflected from the original image through the opaque conductive member and thus exposing the photosensitive surface according to the reflected light patterns. The light conductive members include light insulating means associated therewith and with the luminescent member for preventing the direct illumination of the luminescent member from reaching the photosensitive surface.

3,704,067

VIEW AND CUTTER APPARATUS

William Randol Womack, 2400 Mainway Building, Clovis, N. Mex.

Filed Nov. 17, 1970, Ser. No. 90,319
Int. Cl. G03b 29/00
U.S. Cl. 355—29 2 Claims



Apparatus is provided for accurately cutting Panorex radiographs on a mounting frame which may be illuminated to aid in the cutting. The apparatus also includes a removable mounting frame so that the Panorex film may be duplicated. A timer is provided to control the illumination for exposure of the duplicating film. The combined apparatus affords an improved means for accurately cutting the film so that the two halves may be reassembled in accurate relationship to view right and left teeth exposures and also for accurately exposing the film to provide duplicate copies of the same.

3,704,068

MICRO-IMAGE RECORDING AND READ-OUT SYSTEM

Adnan Waly, Stamford, Conn., assignor to Personal Communications Inc., Stamford, Conn.

Filed April 21, 1971, Ser. No. 135,996
U.S. Cl. 355—46 29 Claims

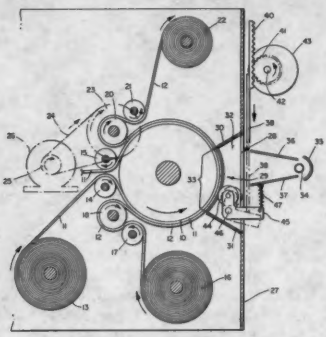
A microimage technique for recording information such as the pages of a book, in a reduced scale on a film surface, and for reproducing the microimages of the pages in an enlarged scale by means of an optical reader whose overall dimensions are comparable to those of an ordinary book. The pages of the book are recorded as multiple microimages on the film surface of a micro-record in an interlaced fashion, whereby the characters constituting each page are interspersed with the characters of the other pages. The reader is provided with a lens matrix constituted by a planar array of lensettes having short focal lengths, each of which is adapted to enlarge a respective individual character in the group of characters forming the text of a microimage representing a single page. The reader includes means to index the multiple-image microrecord relative to the matrix whereby successive microimages are presented on a screen parallel to the matrix. The screen dimensions are comparable to those of an original page. The optical throw or distance between the lens matrix and the screen is extremely short, whereby the depth of the reader may be as small as one inch.

3,704,069

FILM PROCESSING APPARATUS

Paul E. Kitch, Springfield, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Filed April 26, 1971, Ser. No. 137,330
Int. Cl. G03b 27/10
U.S. Cl. 355—110 28 Claims



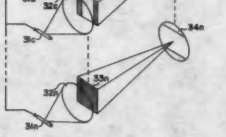
Apparatus for processing or handling film such as in projection systems and the like, and particularly apparatus for the contact duplication of film, in which the shutter movement is film speed responsive, that is, the shutter position is determined by the speed of film movement through the exposure station so that the shutter closes when the speed of film movement drops to a level where heat-damage might commence to the film due to prolonged dwell in the exposure station where it is exposed to heat and light from the projection lamp. The apparatus also automatically dims the projection lamp when the shutter is closed, thereby increasing the life of the lamp. The apparatus further includes a pressure roll for engaging the film to obtain good contact between the films during exposure. The pressure roll is automatically removable from contact with the film when the shutter is closed, so as to facilitate feeding of a new film into the apparatus.

3,704,070

DIRECTION DETERMINING SYSTEM

Philip M. Johnson, Windham; Wilfried G. Dudevoir, and Richard M. Northrup, both of Nashua, all of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed May 24, 1971, Ser. No. 146,392
Int. Cl. G01b 11/26; H04b 9/00
U.S. Cl. 356—152 20 Claims



A system is described in which a plurality of energy sources sequentially project segments of a directional code to a predetermined sector of space. An observer within the sector determines the angle between a reference direction and his line of sight to the system by noting the sequence and timing of the energy pulses he receives as successive segments are projected.

3,704,071

PENCIL HAVING A FORMED ABS POLYMER BARREL

Karl-Heinz Muller, Levekusen; Harry Rohr, Cologne, and Karl-Heinz Ott, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 28, 1968, Ser. No. 755,812

Claims priority, application Germany, Oct. 4, 1967, P 15 61 767.1

Int. Cl. B43k *19/02*; B29d *27/00*

U.S. Cl. 401—96 6 Claims

Pencils comprising a lead and a foamed thermoplastic moulding composition sheathed around this lead and having a density of from 0.3 to 0.7 g /cc.

3,704,072

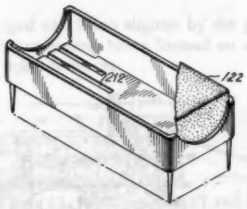
IMPLEMENTS (III)

Jack W. Kaufman, 357 Frankel Blvd., Merrick, L. I., N.Y.

Continuation-in-part of Ser. No. 660,477, Aug. 14, 1967, abandoned, and a continuation-in-part of Ser. No. 665,593, Sept. 5, 1967, abandoned. This application Nov. 12, 1969, Ser. No. 875,907. The portion of the term of this patent subsequent to July 11, 1982, has been disclaimed.

Int. Cl. A46b *11/04*

U.S. Cl. 401—291 11 Claims



Implements, as for cleansing by scrubbing with the use of a cleansing compound, such as for surgical post or preoperative scrubbing with a germicidal soap comprising, means for providing rubbing type scrubbing action, for example, a pored surface or a plurality of bristle-like elements, such as Velcro or brush bristles and a quantity of compound, for example, a cleansing compound such as a germicidal soap compound associated therewith, for example, by direct coating on the scrubbing means or by being contained within a dispensing type reservoir for application to the scrubbing means, such as being contained within a block of resilient foam-like material or within a flexible walled container whereby pressure on the container or foam block will cause dispensing of the cleansing compound outwardly thereof and onto the scrubbing means, the foam block or container being either permanently associated with the scrubbing means to define a throw-away type implement or the block or container being replaceably associated therewith to enable retention of the scrubbing means with replacement of the container or block, such block or throw-away implement being preferably furnished with protective covering means during transport, storage and prior to usage thereof, such as a peelable or strippable layer of waterproof adhesively secured material or a layer of water-soluble material. The size, shape and density of the brush bristle array permits the implement to function not only as a general personal scrubbing brush, but also as scrubbing apparatus for pre- and post-surgical applications. The implement includes a longitudinally flexible handle which is adapted to hold the dispensing type reservoir and be bent to the contour of the surface being scrubbed.

3,704,073

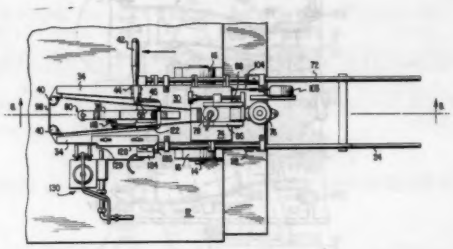
VEE MACHINING CENTER

John A. Cupler, II, 10 Cupler Drive, Cumberland, Md.

Filed Dec. 7, 1970, Ser. No. 95,678

Int. Cl. B23b *35/00*, *47/16*

U.S. Cl. 408—1 15 Claims



A Vee machining center employing two distinct non-captive tool retaining means which are, each, operable to retain a tool in substantially the same position as a function of the tool releasing movement of the other. One of the retaining means consists of the usual flexible drive belt for rotating the tool while the other comprises a mechanical gripper providing temporary support for the tool during tool interchange.

Two distinct, alternately usable power sources provide two distinct speed control ranges for the machining center.

3,704,074

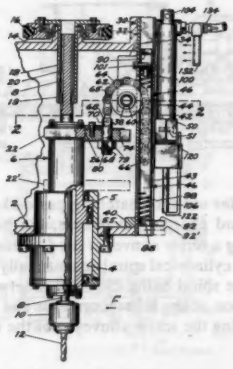
OFFSET FEED CONTROL

Richard E. Deschner, 5550 Harcross Drive, Los Angeles, Calif.

Filed June 11, 1971, Ser. No. 152,202

Int. Cl. B23b *47/22*

U.S. Cl. 408—11 14 Claims



This disclosure describes a hydraulic feed control for reciprocative machines which rotate and feed a tool-bit into a workpiece.

3,704,075

COMBINED TURBINE NOZZLE AND BEARING FRAME

Karl W. Karstensen, Peoria, and Richard W. Kizer, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

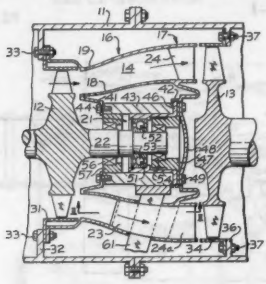
Filed Dec. 14, 1970, Ser. No. 97,575

Int. Cl. F02c *3/10*

U.S. Cl. 415—68 4 Claims

A turbine engine having a gasifier turbine rotor and a power turbine rotor, a bearing frame providing a bearing support for the shaft of the gasifier turbine rotor, the bearing frame and a

turbine nozzle being integrally formed to provide a continuous annular passage between the rotors, support struts extending radially across the annular passage within the bearing frame



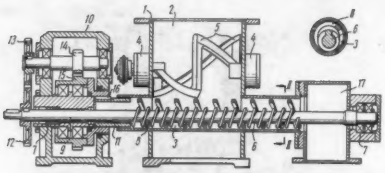
being integrally formed with respective vanes extending radially across the annular passage within the turbine nozzle to simplify construction of the turbine engine and reduce flow disturbance within the annular passage.

3,704,076

SCREW FEEDER FOR PASTE-LIKE MATERIALS

Igor Vasilievich Bodunov; Boris Sergeevich Modestov, and Viktor Vasilievich Ivanchenko, all of Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R., assignors to Severodonetsky Filial Nilhimmash, Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

Filed Dec. 16, 1970, Ser. No. 98,760
Int. Cl. F01d *5/00*
U.S. Cl. 415—72 **2 Claims**



A screw feeder used for batching paste-like materials, having batching and charging chambers, the batching chamber accommodating a screw conveyor used to displace the material and having a cylindrical spiral eccentrically secured thereto, the turns of the spiral being disposed inbetween the tunrs of the lower portion of the screw conveyor and, in the course of rotation, cleaning the screw conveyor of the material adhered thereto.

3,704,077

THRUST CONTROLLER FOR PROPULSION SYSTEMS WITH COMMONLY DRIVEN, CONTROLLABLE PITCH PROPELLERS

Elwood J. Meyers, Rockford, and Earl J. Falk, Byron, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Nov. 3, 1970, Ser. No. 86,452
Int. Cl. B63h *3/10*
U.S. Cl. 416—30 R **12 Claims**

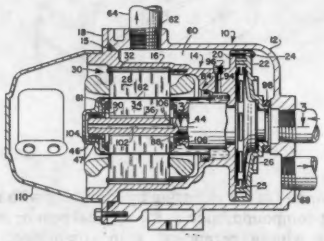
A method and apparatus for controlling the thrust delivered by each propeller of a marine propulsion system of the type having a plurality of controllable pitch propellers driven by a common power source. In response to electrical signals supplied to define commanded thrust levels for the propellers, the power source is controlled to provide the power necessary to satisfy the power requirements of the propulsion system and the propeller pitches are individually set so that each propeller absorbs only its proportionate share of the power. Alternative provision is made for carrying out the foregoing in a speed mode or in a power mode. In the speed mode, the power source is controlled in response to any given set of commanded thrust levels so as to maintain the propellers rotating at a substantially constant speed which is selected to be the higher of a predetermined idle speed for the propulsion system and of the minimum speed necessary to satisfy the highest of the commanded thrust levels. In the power mode, the power source is controlled in response to any given set of commanded thrust levels so as to deliver a substantially constant amount of power which is selected to be the power necessary for the propellers to deliver the amounts of thrust commanded therefrom without their shaft speed dropping below the idle speed. The method and apparatus are also compatible with an operation of the propulsion system in which separate engines are dedicated to the several propellers.

3,704,078

DEEP WELL TYPE PUMP

William J. Conery, and Donald A. Kaessen, both of Ashland, Ohio, assignors to Hydr-O-Matic Pump Company, Hayesville, Ohio

Filed Jan. 22, 1971, Ser. No. 108,806
Int. Cl. F04b *17/00, 35/00, 39/02;* **F01d** *25/24;* **H02k** *5/10*
U.S. Cl. 417—369 **7 Claims**



The motor-pump unit of the invention relates to a self-priming centrifugal pump and electric motor combination wherein the apparatus includes a sealed outer housing means having liquid inlet and a discharge outlet, a pump mounted within the housing means, an electric drive motor positioned within the housing means and including an inner housing for the electric motor. The inner housing is secured to the housing means to form a cooling chamber around the electric motor, and the pump has an outlet connecting to the cooling chamber for circulation of the pumped liquid around the motor housing prior to discharge from the apparatus.

3,704,079

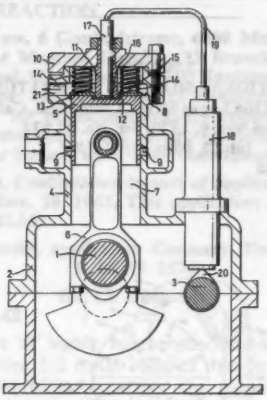
AIR COMPRESSORS

Martin John Berlyn, Beacon Lodge, Texas Street, Morley, Leeds, LS 27 OHG Yorkshire, England

Filed Sept. 8, 1970, Ser. No. 70,072
Int. Cl. F04b *39/06*
U.S. Cl. 417—438 **6 Claims**

An air compressor of the cylinder and reciprocating piston type comprises an inlet port formed in the wall of the cylinder

so as to be uncovered by the piston near bottom dead center, and a spring-loaded annular discharge valve co-acting with two concentric seatings to close the upper end of the cylinder



but which is engaged and lifted slightly by the piston at top dead center, the inner seating being formed on a valve guide embodying water injector means.

3,704,080

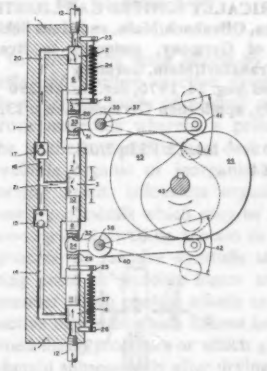
FLUID ENGINE

Grosvenor M. Cross, West Concord, Mass.

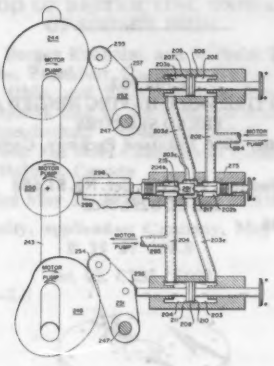
Filed July 22, 1970, Ser. No. 57,165

Int. Cl. F04b *19/00, 37/00, 21/02, 39/15*

U.S. Cl. 417—486 **8 Claims**



A fluid engine for the transfer of energy between a rotating shaft and a fluid flowing at a constant velocity relative to the angular velocity of the shaft, consisting of a plurality of energy-transfer modules connected hydraulically in series, each module effecting in turn an energy transfer between the fluid and a piston during an active period, the terminal portions of



the active periods of adjacently ordered modules being arranged to overlap at a constant velocity.

3,704,081

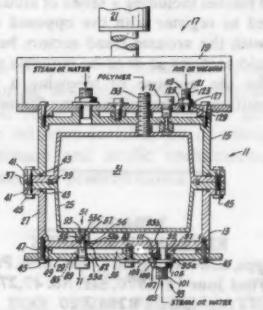
VACUUM MOLD FOR MAKING FOAMED POLYMERIC ARTICLES

Richard H. Immel, Sewickley, Pa., assignor to Sinclair-Koppers Company

Filed Jan. 21, 1971, Ser. No. 108,273

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 **7 Claims**



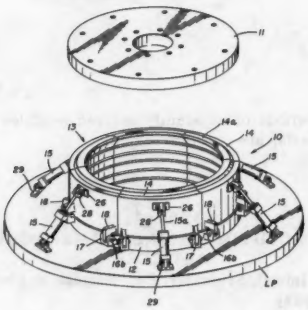
A mold for the vacuum molding of foamed cellular thermoplastic articles has two cooperating sections which when placed together define a mold cavity. Each section has three shells and two standard chests including an inner shell, an intermediate shell and an outer shell. The intermediate shell is spaced apart from the inner shell to define a first chest and the outer shell is spaced apart from the intermediate shell to define a second chest. The first chest has inlet and outlet means which are connected to a source of heating and cooling media and the second chest has inlet and outlet means which are connected to atmospheric air, compressed air and vacuum lines. A plurality of venting means communicate between the mold cavity and the second chest whereby a vacuum may be drawn or air may be charged into the mold cavity. At least one section has inlet means for passing expanded or partially ex-

panded granules of a thermoplastic material into the mold cavity after the sections are brought together and a means for opening and closing the mold sections by moving one of the sections relative to the other.

3,704,082
SEGMENTED TIRE MOLD HAVING HINGED ARCUATE TREAD SECTORS

Dwight E. Hottle, 2866 Lakeland Parkway, Cuyahoga Falls, Ohio

Filed Oct. 19, 1970, Ser. No. 81,688
Int. Cl. B29h 5/02
U.S. Cl. 425—46 **2 Claims**

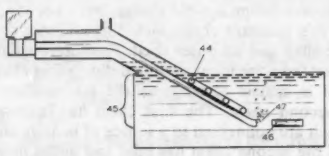


A three-piece segmented tire mold including opposed sidewall mold sections that are movable toward and away from each other for molding the sidewall portions of a pneumatic tire, and further including a series of arcuate tread mold sectors adapted to register with the opposed sidewall mold sections and with the arcuate tread sectors being hinged to one of said mold sections so as to be movable around a fixed hinge point for the purpose of receiving a tire and subsequently permitting removal of the same following vulcanization.

3,704,083
EXTRUSION MACHINE

Arthus L. Phipps, 6204 Raymond Court, Erie, Pa.

Filed June 18, 1970, Ser. No. 47,277
Int. Cl. B29d 7/20
U.S. Cl. 325—71 **3 Claims**

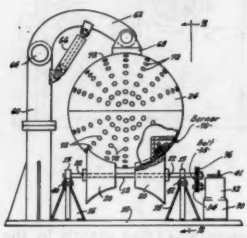


A method or process for the extraction of a material, especially delicate or fragile materials such as plastic foams or forms, out of a vacuum chamber and removing the material from the chamber into atmospheric pressure without exerting destructive forces on the material other than the gradual application of the atmospheric pressure itself through the use of a liquid medium.

3,704,084
ROTATIONAL MOLDING APPARATUS

Robert A. Clay, 1306 Logan Street, Costa Mesa, Calif.

Filed Nov. 9, 1970, Ser. No. 87,933
Int. Cl. B29c 25/00, 5/04
U.S. Cl. 425—404 **8 Claims**

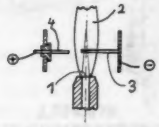


A rotational molding apparatus is provided in which a hollow spherical member is supported on rollers, and in which the rollers are controlled to cause the spherical member to turn on an infinite number of axes. One or more molding cavities are supported within the spherical member and which rotate therewith to carry out rotational molding operations.

3,704,085
ARRANGEMENT OF IGNITION ELECTRODES OF ELECTRICALLY IGNITED GAS LIGHTERS

Helmut Pietzonka, Offenbach/Main, and Hans Schindler, Egelsbach, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt/Main, Germany

Filed Aug. 24, 1970, Ser. No. 66,290
Claims priority, application Germany, Aug. 23, 1969, P 19 43 048.9
Int. Cl. F23q 2/08
U.S. Cl. 431—264 **13 Claims**



One ignition electrode is arranged above the gas discharging nozzle of the gas lighter and extends into the central zone of the gas jet to function as a gas reflecting member; the other electrode is located outside this central zone.

CHEMICAL

3,704,086

PRODUCTION OF HIGHLY CONCENTRATED, STABLE STOCK SOLUTIONS CONTAINING 1:2 METAL COMPLEX DYES IN A SINGLE STEP REACTION

Dimiter Bayew, 6 Gontardstrasse, 6800 Mannheim, Germany; and Manfred Daeuble, 33 Brunckstrasse, 6710 Frankenthal, Germany; and Otto Kaufmann, 52 Rheinrugenstrasse; Ludsteck Enno, 12 Woehlerstrasse; Dieter Ludsteck, 39 Rheinrugenstrasse; Helmut Pfitzner, 6 Liebermannstrasse; and Heinz-Guenter Witsch, 2 Ungsteiner Strasse, all of 6700 Ludwigshafen, Germany

No Drawing. Continuation-in-part of application Ser. No. 693,162, Dec. 26, 1967. This application June 1, 1970, Ser. No. 42,561

Claims priority, application Germany, Dec. 29, 1966, P 16 19 357.0

Int. Cl. D06p *1/10*

U.S. Cl. 8—42 5 Claims

Production of highly concentrated stable stock solutions containing 1:2 metal complex dyes in a single step reaction comprising contacting the corresponding azo dyes in oxygen containing water-miscible solvents with a metallizing agent. The dye solutions are useful for dyeing natural or synthetic polyamides.

3,704,087

ALKYLATING AGENT NEUTRALIZING DIALKYLAMINE FROM DIALKYLAMINOALKYL SULFONE REACTIVE DYE IN CONTINUOUS ACID RESIST PRINTING AND STEAMING

Erich Feess and Sienling Ong, Lorsbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 25, 1971, Ser. No. 174,925

Claims priority, application Germany, Aug. 27, 1970, P 20 42 418.4

Int. Cl. D06p *5/00*

U.S. Cl. 8—66 5 Claims

A process for producing resist effects by means of reactive dyestuffs under other reactive dyestuffs on flat-surface textile structures made of natural or regenerated cellulose fibrous materials wherein a printing paste is printed on the textile material in any desired order containing non-volatile organic or inorganic acids or acid salts as reserving agent, colourless organic alkylating agents and reactive dyestuffs which may be fixed according to the two-step cold-dwelling process or the two-step rapid-fixing process for reactive dyestuffs and wherein a further printing paste or padding liquor are applied in overlapping manner which contain alkalis as fixing agents and other reactive dyestuffs which cannot be fixed by the above-mentioned fixing processes or which give only low-yields, and wherein subsequently after drying the material thus treated, fixing of the dyestuffs is carried out by steaming in combination with one of the above-mentioned two-step fixing processes.

The addition of the alkylating agent in the present process binds the dialkylamine set free by the less reactive dyestuffs in the steamer and avoids its reaction with the acid reserving agents and/or the more reactive dyestuffs.

3,704,088

METHOD OF RESTRICTING OXIDATION OF SPONGE IRON

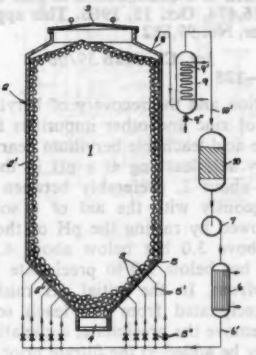
Horst Nagel, Bergen Enkheim, and Wilhelm Thumm and Horst Garbe, Frankfurt, Germany, William H. Dailey, Cleveland, Ohio, and Egon Goedeke, Frankfurt, and Rolf Dadazynski, Rod an der Weil, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany, and The Steel Company of Canada Limited, Hamilton, Ontario, Canada

Filed May 22, 1970, Ser. No. 39,630

Claims priority, application Germany, May 29, 1969, P 19 27 300.8

Int. Cl. C23f *15/00*

U.S. Cl. 21—2.5 4 Claims



A system for reducing the oxidation of agglomerated sponge iron during storage or transit wherein the mass of iron is stored in an enclosure having a gas-permeable bottom and air, nitrogen-enriched air or nitrogen, treated to remove moisture and acidic constituents, is passed through the mass at a predetermined rate.

3,704,089

PROCESS FOR THE STERILIZATION OF MEDICINAL TISSUE-BINDING SUBSTANCES

Gerhard Stehlik, Leithaprodersdorf, Austria, assignor to Osterreichische Studiengesellschaft fur Atomenergie G.m.b.H., Vienna, Austria

No Drawing. Filed Nov. 12, 1970, Ser. No. 89,117

Claims priority, application Austria, Nov. 17, 1969, 10,742/69

Int. Cl. A61l *13/00*

U.S. Cl. 21—54 R 6 Claims

In a process for the sterilization of medicinal tissue-binding substances based on monomeric or oligomeric esters of cyano-acrylic acids, the sterilization being carried out by ionizing irradiation, e.g., gamma irradiation, after the esters have been cooled preferably to below their solidification points.

3,704,090

CORROSION INHIBITION USING N-AMINOALKYL PHTHALAMIDES

Robert S. Taylor, Livermore, Calif., assignor to Hexcel Corporation, Dublin, Calif.

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,673

Int. Cl. C23f 11/14

U.S. Cl. 21—2.7 5 Claims

Aromatic dicarboxamide diamines are provided for use as aqueous rust inhibitors or temperature controlled curing or cross-linking agents for polymers having amine reactive functionalities, e.g. epoxy resins and polyisocyanate resins.

3,704,091

EXTRACTION OF BERYLLIUM FROM ORES

James K. Grunig and William B. Davis, Tucson, Ariz., and William C. Aitkenhead, Belize, British Honduras, assignors to The Anaconda Company, New York, N.Y.

Continuation-in-part of application Ser. No. 710,984, Mar. 6, 1968, which is a continuation-in-part of application Ser. No. 316,474, Oct. 15, 1963. This application Dec. 21, 1970, Ser. No. 99,852

Int. Cl. C22b 59/00

U.S. Cl. 423—128 11 Claims

The extraction and the recovery of beryllium substantially devoid of zinc and other impurities from low and medium grade acid-leachable beryllium bearing ores is accomplished by acid-leaching at a pH in the range from about 1.2 to about 2, preferably between 1.3 and 1.5, and advantageously with the aid of a soluble fluoride additive, followed by raising the pH of the leach liquor initially to above 3.0 but below about 4.5 and finally to above 7.5 but below 9.0 to precipitate beryllium hydroxide therefrom. In the initial pH raising step, aluminum is precipitated from the leach solution. After filtration to remove the precipitate, a chelating agent such as EDTA may be added to the filtrate prior to the second pH raising step for the precipitation of beryllium values therefrom. The precipitated beryllium hydroxide is further purified by redissolution and hydrolysis in sodium hydroxide solution. Alternatively, it may be treated with strong and hot concentrated sulfuric acid prior to the precipitation of beryllium values as a hydroxide. The zinc is removed from the final beryllium product by treating the leach liquor with a soluble sulfide after the initial pH raising step or before the hydrolysis of the redissolved beryllium hydroxide.

3,704,092

MANUFACTURE OF NaF/AlF_3 DOUBLE SALT

Maurice Clark Harrison and Donald Otis Vancil, Longview, Wash., assignors to Reynolds Metals Company, Richmond, Va.

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,129

Int. Cl. C01f 7/52, 7/50; C01d 3/02

U.S. Cl. 423—465 10 Claims

A sodium fluoride-aluminum fluoride double salt, such as chiolite, of high purity and virtually free from CaO and P_2O_5 contamination, is prepared from impure fluosilicic acid containing these impurities, such as the by-product from the manufacture of phosphates from phosphate rock, by treating a portion of the fluosilicic acid with a reactive aluminous material to convert it completely to AlF_3, and separating the precipitated CaO, P_2O_5, and silica, reacting a second portion of the fluosilicic acid with sodium hydroxide or sodium carbonate to convert it to NaF and separating the insoluble precipitate of CaO, P_2O_5, and SiO_2; admixing the AlF_3 and NaF solutions at about 140° F.–190° F. while maintaining the pH between about 3.0 and 6.8 to keep SiO_2 in solution, and recovering the precipitated double salt.

3,704,093

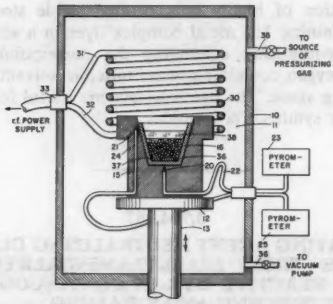
METHOD OF SYNTHESIZING INTERMETALLIC COMPOUNDS

John S. Haggerty, Lincoln, and Joseph F. Wenckus, Needham, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed June 15, 1970, Ser. No. 46,242

Int. Cl. C01g 15/00; C01b 17/00

U.S. Cl. 423—299 15 Claims



Method of forming intermetallic compounds and the like, particularly Group III–V and Group II–VI compounds. The reactants are placed in a crucible and covered with an encapsulant which is caused to flow through and over the reactants to seal the system prior to the time that a temperature is reached when the vapor pressure of one or more of the reactants becomes appreciable. A temperature gradient may be established along the vertical axis of the crucible during the sealing period. When the system is sealed the overpressure is raised and the temperature is increased to a level at which the reaction is completed. Noncondensables such as nitrogen may also be used as reactants.

3,704,094

PROCESS FOR THE PRODUCTION OF ELEMENTAL SILICON

Richard Joseph McClincy, Lewiston, James Herbert Downing, Clarence, and Benjamin John Wilson, Youngstown, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Nov. 19, 1969, Ser. No. 878,229, now Patent No. 3,660,298. Divided and this application Jan. 19, 1972, Ser. No. 219,114

Int. Cl. C01b 33/02

U.S. Cl. 423—350 3 Claims

A low density stoichiometric agglomerated furnace charge for use in the carbothermic reduction of silica in

electric type furnaces according to the overall reaction of $SiO_2+2C \rightarrow Si+2CO$. The charge comprises a fine fraction and a coarse fraction of particulated silica homogeneously mixed with a particulated carbon and a low density filler to provide an overall average bulk density of between about 20 and 50 pounds per cubic foot.

3,704,095

TREATMENT OF GASES

Thomas Nicklin, Manchester, England, assignor to The Gas Council, London, England

Filed Feb. 2, 1971, Ser. No. 111,814

Int. Cl. C01b *17/04*

U.S. Cl. 423—242 **8 Claims**

A composition suitable for use in removing sulphur oxides from gas containing sulphur oxides (such as flue gas) is described. The composition essentially comprises (i) an oxide of uranium and/or a precursor therefor, (ii) an oxide of thorium and/or a precursor therefor, and (iii) an alkali metal or alkaline earth metal oxide and/or a precursor therefor. The constituent (iii) is preferably sodium or lithium oxide, and the composition is preferably disposed on a carrier such as α-alumina. The composition may be regenerated after use by exposure to a hydrogen-containing gas.

3,704,096

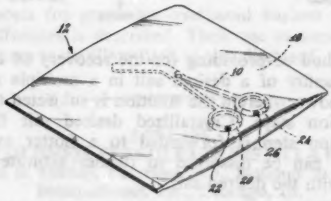
STERILIZING PACKAGE AND METHOD AND MEANS FOR STERILIZING AN ARTICLE AND THEREAFTER CHECKING ITS STERILITY

Christ J. Verses, Fairfield, and Eskil L. Karlson, Stamford, Conn., assignor to Pollution Control Industries, Inc., Stamford, Conn.

Filed Oct. 16, 1970, Ser. No. 81,256

Int. Cl. G01d *21/00*; G01n *31/22*

U.S. Cl. 23—230 R **4 Claims**



Means are provided to indicate by color change or lack of color change occurring within a predetermined time interval whether a sterilizing environment has been attained in a sealed container filled with ozone mist. A new package is provided comprising a transparent, sealed container having therein an ozone mist sterilizing environment, an article to be made and kept sterile by said environment, and an indicator adapted to visually signal whether such environment has in fact been attained.

3,704,097

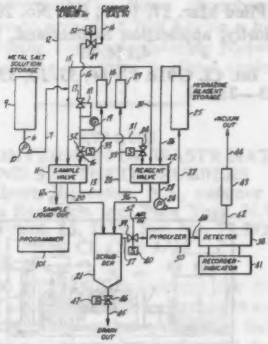
TOTAL MERCURY MONITOR

Italo A. Capuano, Orange, Conn., assignor to Olin Corporation

Continuation-in-part of application Ser. No. 75,927, Sept. 28, 1970. This application Feb. 16, 1971, Ser. No. 115,175

Int. Cl. G01n *21/26, 33/18, 31/10*

U.S. Cl. 23—230 R **10 Claims**



Apparatus and method for analyzing liquid streams for their content of mercury including elemental mercury, ionic mercury and undissociated mercury compounds such as phenyl mercury and methyl mercury. The sample is automatically measured and treated with aqueous hydrazine and a metal salt reagent capable of reacting with hydrazine to form a suitable catalytic colloid. Elementary mercury, formed by the action of hydrazine and the catalytic colloid on the combined mercury, is transferred to a photometric detector and the results are indicated and/or recorded automatically, accurately and rapidly. The apparatus and method are especially useful in the control of mercury contamination in the environment and also for monitoring chemical process streams.

3,704,098

COLORIMETRIC INDICATOR SOLUTION FOR THE DETECTION OF NITROGEN DIOXIDE AND METHOD OF ANALYSIS

Avery B. Smith, Wallingford, Ralph R. Hennig, Cos Cob, Abraham J. Kurtz, Norwalk, and Gregory Pantchenko, Westport, Conn., assignors to Resource Control, Inc.

No Drawing. Filed June 22, 1970, Ser. No. 48,491

Int. Cl. G01n *21/12*

U.S. Cl. 23—232 R **6 Claims**

Soluble tablets suitable for providing an indicator solution of the colorimetric type for quantitatively measuring the nitrogen dioxide contamination in an atmosphere are disclosed. The indicator solution, which has a pH of

not more than 4.0, is conveniently prepared by dissolving a tablet containing a diazotizing agent mechanically supported in a suitable manner and a second tablet containing a coupling agent also mechanically supported in a suitable manner in a predetermined amount of water. A measured solution is transferred to an absorption bubbler of the type customarily employed in colorimetric analysis, the reagent solution is exposed to metered quantities of air containing nitrogen dioxide as a contaminant thus resulting in the formation of red-violet diazo dye. On examination of the sample thus exposed in a colorimeter, the nitrogen dioxide content is readily measured.

3,704,099

COAGULOMETER

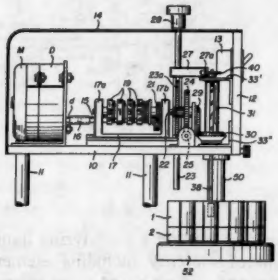
Manuel Claude Sanz, Geneva, Switzerland, assignor to Micromedic Systems, Inc., Philadelphia, Pa.

Filed Mar. 17, 1970, Ser. No. 20,341

Claims priority, application Switzerland, Mar. 19, 1969, 4,124/69

Int. Cl. G01n *11/14, 33/16, 33/26*

U.S. Cl. 23—253 R **11 Claims**



An apparatus for determining the coagulation time of blood and other liquids which has a motor driven rotating stirrer that is mounted for vertical movement on a base below which is mounted a rotatable indexing support member bearing liquid samples. A manually operable rack is used to insert the stirrer in the containers and to start the motor to rotate the stirrer. A slip switch is used to break the circuit when the stirrer encounters resistance caused by the coagulation. The time for coagulation is read directly off a counter attached to the motor.

3,704,100

POLYMERIZATION APPARATUS

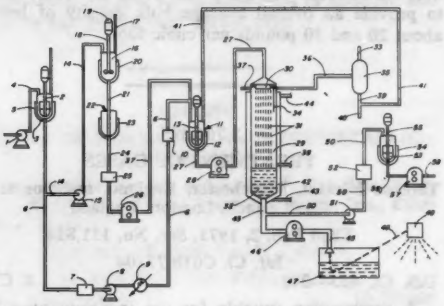
Ian C. Twilley, Chester, and William N. Russell and Weldon H. Peterson, Colonial Heights, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Original application Apr. 15, 1969, Ser. No. 816,286, now Patent No. 3,579,483, dated May 18, 1971. Divided and this application July 6, 1970, Ser. No. 60,978

Int. Cl. C08g *20/14, 20/42*

U.S. Cl. 23—260 **3 Claims**

Apparatus for polymerization of ε-caprolactam to produce a polycaproamide polymer more rapidly and with the extent of polymerization far greater than heretofore by utilizing a vacuum demoisturizing column within the polymerization train that upon extrusion of said polymer the volatiles are substantially all removed by an entrainment separator means whereby an improved polycaproamide polymer is obtained.



3,704,101

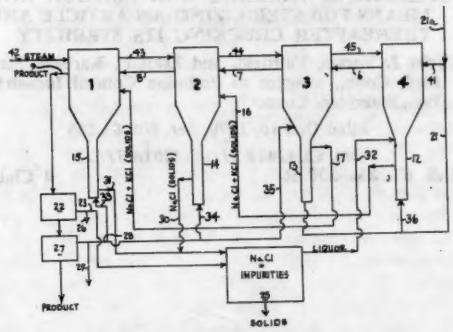
METHOD FOR OPERATING MULTIPLE EFFECT EVAPORATORS

Clifford J. Kelly, Regina, Saskatchewan, Canada, assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada

Filed Aug. 25, 1970, Ser. No. 66,779

Int. Cl. B01d *9/00, 3/04*

U.S. Cl. 23—296 **17 Claims**



A method of providing for the recovery of the maximum quantity of a desired salt in a multiple salt solution is shown wherein the solution is subjected to several evaporation steps. Crystallized desired salt from one evaporation step is forwarded to a hotter evaporator where it can be dissolved to further saturate solution therein with the desired salt.

3,704,102

PRODUCTION OF CAUSTIC SODA PRILLS

Edward Merle Allen, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation of abandoned application Ser. No. 757,750, Sept. 5, 1968. This application June 25, 1971, Ser. No. 156,924

Int. Cl. B01j *2/04*

U.S. Cl. 23—302 **8 Claims**

Caustic soda prills are prepared by controllably cooling molten caustic soda droplets to a temperature below 260°

C. but above about 122° C. with a moisture bearing gaseous coolant. Further cooling is then conducted in the absence of water vapor, e.g., by cooling in a moisture free gaseous environment.

3,704,103

METHOD OF PREPARING SINGLE CRYSTALS OF MERCUROUS CHLORIDE

Cestmir Barta, Prague, Czechoslovakia, assignor to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed Jan. 20, 1970, Ser. No. 4,417
Int. Cl. C01g *13/04*
U.S. Cl. 23—305 5 Claims

Method of preparing single crystals of mercurous halides, which comprises separating the respective mercurous halide from the ambient atmosphere, heating the system to a temperature of at least 120° centigrade, and cooling to the respective crystallization temperature after a pressure of at least 0.015 torr in the system has been reached.

3,704,104

PROCESS FOR THE PRODUCTION OF TRICHLOROSILANE

Mohendra S. Bawa and Donald O. Thur, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,356
Int. Cl. C01b *33/04*
U.S. Cl. 423—342 6 Claims

In the production of trichlorosilane (TCS) from the reaction of elemental silicon with hydrogen chloride, substantially improved yields are obtained by separating dichlorosilane (DCS) and silicon tetrachloride (TET) from the product mixture and recycling these by-products to the reaction zone. In the preferred embodiment, it is essential to maintain the molar ratio of recycled silicon tetrachloride to recycled dichlorosilane no greater than 1.0. Also, the following conditions are preferably maintained in the reaction zone: (1) a short residence time, (2) a low partial pressure of HCl, and (3) a relatively low temperature.

3,704,105

PROCESS FOR PREPARING OVERBASED BARIUM SULFONATES AND THEIR USE IN DIESEL FUELS

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Sept. 16, 1968, Ser. No. 762,371
Int. Cl. C10l *1/32*
U.S. Cl. 44—51 9 Claims

A process for preparing overbased barium olefin derived sulfonates is described. Their use as smoke reducing additives in distillate fuels is also disclosed.

3,704,106

COLORED PETROLEUM DISTILLATE

Richard B. Orelup, Paterson, N.J., assignor to Morton International, Inc., Chicago, Ill.

No Drawing. Original application Oct. 24, 1967, Ser. No. 677,733. Divided and this application Mar. 23, 1970, Ser. No. 22,066
Int. Cl. C10l *1/22*
U.S. Cl. 44—59 4 Claims

A petroleum distillate is imparted with a distinct colorization by a liquid azo dye composition soluble in the distillate. The liquid azo dye composition is characterized in that it

(a) has a color value which is at least about forty percent of the color value of a comparable solid dye;

(b) exhibits permanently homogeneous liquidity;

(c) is capable of complete and substantially instantaneous solubility in petroleum distillates; and

(d) essentially consists of between about 50–75% by weight of a mixture of azo dyes containing C_8–C_{12} alkyl beta-naphthols or p-C_8–C_{12} alkyl phenol in the dye molecule and about between 50–25% by weight of a liquid organic viscosity depressant compatible with the azo dyes.

3,704,107

FUEL COMPOSITION

Raymond C. Schlicht, Fishkill, and George W. Eckert and Ronald W. Von Allmen, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,938
Int. Cl. C10l *1/18, 1/26*
U.S. Cl. 44—58 10 Claims

Turbine, diesel and motor fuel composition comprising a hydrocarbon or a mixture of hydrocarbons in the middle distillate or kerosene and gasoline boiling ranges containing a bis-(hydroxyethyl) alkane phosphonate in an amount effective to provide a fuel having a high level of anti-wear, anti-icing and rust-inhibiting properties and a method for operating a turbine or diesel engine.

3,704,108

HYDROCONVERSION OF WASTE NATURAL AND SYNTHETIC RUBBERS

Seymour B. Alpert, Princeton, N.J., assignor to Hydrocarbon Research, Inc., New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,592
Int. Cl. C10l *1/16*
U.S. Cl. 44—62 25 Claims

Waste natural and synthetic rubbers are converted in the presence of a catalyst and in a hydrogen environment by passing a particulate rubber slurry and hydrogen upwardly through a reactor maintained under temperatures in the 700 to 850° F. range and pressures in the 500 to 3000 p.s.i.g. range. The particulate rubber is converted in the reactor to hydrocarbon liquids while unconvertible solids originally compounded with the rubber leave unchanged in the product. The hydrocarbon stream can have a wide range of properties depending on the objectives of the user of the process.

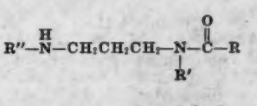
3,704,109

MOTOR FUEL COMPOSITION

Stanley R. Newman, Fishkill, Rona'd W. Von Allmen, Hopewell Junction, and Kenneth L. Dille and Herbert E. Vermillion, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 20, 1968, Ser. No. 785,774
Int. Cl. C10l *1/26*
U.S. Cl. 44—66 6 Claims

Motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling in the gasoline boiling range containing (1) the salt reaction product of (A) a paraffinic oil oxidate having a neutralization number between 55 and 80 and a saponification number between 100 and 200, and (B) an amide having the formula



in which R is a monounsaturated hydrocarbyl radical having from 16 to 18 carbon atoms and R′ and R″ alternately represent hydrogen and a hydrocarbyl radical having 14 to 18 carbon atoms, and (2) a normally liquid amine salt of branched chain primary alkyl acid esters of orthophosphoric acid in which each esterifying group contains 13 to 16 carbon atoms and the amine is an aliphatic

hydrocarbon monoamine of 6 to 24 carbon atoms in which each aliphatic hydrocarbon radical is attached to the nitrogen through a saturated carbon atom.

3,704,110
ELECTRICALLY CONDUCTIVE SURFACE
John B. Finn, 6116 Applegate 43615, and Carl J. Hudecek, 2414 Pemberton Drive 43606, both of Toledo, Ohio
No Drawing. Continuation of abandoned application Ser. No. 849,236, July 24, 1969, which is a continuation of application Ser. No. 588,743, Oct. 24, 1966. This application May 13, 1971, Ser. No. 143,243
Int. Cl. C03b *29/00*
U.S. Cl. 65—32 **10 Claims**

A glass substrate having a composition consisting essentially of 50–94 mole percent SiO_2, 1.5–35 mole percent Cu_2O, 0.5–30 mole percent Al_2O_3, 0–6 mole percent Fe_2O_3, 0 to 6 mole percent AlF_3, 0–6 mole percent NiO, 0–6 mole percent CoO and 0–11 mole percent TiO_2 and having an exposed electrically conductive surface of metallic copper developed from the Cu_2O constituent in situ of said glass substrate by exposure of said glass substrate at elevated temperatures to successive oxidizing and reducing conditions.

3,704,111
RIPENING OF SUGARCANE BY USE OF ALKYL DERIVATIVES OF 3-PHENOXY PYRIDAZINE
Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters Association, Honolulu, Hawaii
No Drawing. Filed Aug. 14, 1970, Ser. No. 63,927
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **6 Claims**

Sucrose yield of sugarcane is increased by treating sugarcane a few weeks prior to harvest with 3-(alkyl phenoxy)pyridazine compounds.

3,704,112
TRISUBSTITUTED-s-TRIAZINE CHLOROACETALDEHYDE ADDUCTS USEFUL AS HERBICIDES
Logan C. Bostian, Convent Station, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Oct. 24, 1969, Ser. No. 869,378
Int. Cl. A01n *9/22*
U.S. Cl. 71—93 **2 Claims**

Novel adducts of 2-alkylamino-4-amino-6-chloro-s-triazines with chloroacetaldehydes are prepared by reacting the amino substituted-s-triazine with di- or trichloroacetaldehyde in an inert solvent. Reaction temperatures of 40 to 100° C. for one-half to one hour are preferred. The reaction mixture may be cooled to separate the product; evaporation of the solvent at advanced temperatures should be avoided as this may form undesirable by-products. The products are highly selective heribicides. The compound 2-chloro - 4 - (1-hydroxy-2,2,2-trichloroethylamino)-6-isopropylamino-s-triazine is particularly useful because it will selectively destroy weeds in both corn and oat crops, making possible an initial crop of corn immediately followed by an oat crop.

3,704,113
CHLORIDIZING ALUMINA-CONTAINING ORE
Clarence L. Hildreth, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed May 28, 1970, Ser. No. 41,596
Int. Cl. C22b *1/08, 21/00*
U.S. Cl. 75—1 **3 Claims**

A method of beneficiating or upgrading alumina-silica or aluminum-silicate ores, especially natural clays containing substantial amounts of minerals such as kyanite, diaspore and the like, wherein the ore is heated to a relatively high temperature and treated with chlorine.

3,704,114
PROCESS AND FURNACE CHARGE FOR USE IN THE PRODUCTION OF FERROSILICON ALLOYS
Benjamin John Wilson, Youngstown, N.Y., Richard J. McClincy, Tucson, Ariz., and James Herbert Downing, Clarence, N.Y., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Mar. 17, 1971, Ser. No. 125,435
Int. Cl. C22c *39/44*
U.S. Cl. 75—3 **8 Claims**

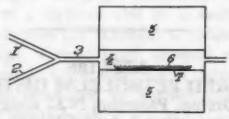
An agglomerated furnace charge, and process thereof, for use in the electric furnace production of ferrosilicon alloys having 45% to 95% silicon by weight. The charge comprises a fine fraction and a coarse fraction of silica homogeneously admixed with a particulated iron-bearing material, a particulated carbonaceous reducing agent and a bulking agent.

3,704,115
HIGH ALLOY STEEL POWDERS AND THEIR CONSOLIDATION INTO HOMOGENEOUS TOOL STEEL
Erik Goran Wastenson, Viken, and Georg Heinrich Arthur Gerhard Bockstiegel, Hoganas, Sweden, assignors to Hoganas AB, Hoganas, Sweden
No Drawing. Filed Feb. 23, 1971, Ser. No. 118,186
Claims priority, application Sweden, Aug. 28, 1970, 11,689/70
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 BC **4 Claims**

The high alloy steel powder contains one or more elements with a strong affinity to oxygen, such as titanium, chromium, and vanadium.

The oxygen content exceeds 0.15%, and the carbon content is related to the oxygen content and to the theoretical carbon content which would stoichiometrically be necessary for forming carbides with the alloying elements. Porous billets are produced by heating the powder in a vacuum to 900–1250° C. to reduce the oxygen content to 0.05%.

3,704,116
DISPERSIONS OF NITRIDES IN A METAL OR ALLOY AND THEIR METHOD OF PREPARATION
Rene A. Paris and Dominique Thibaudon, Lyon, Marc P. Roubin, Villeurbanne, and Jacques M. Paris, Lyon, France, assignors to Agence Nationale de Valorisation de la Recherche, Paris, France
Filed July 1, 1970, Ser. No. 51,517
Claims priority, application France, July 4, 1969, 6922754
Int. Cl. C22c *11/04;* **C01b** *21/06*
U.S. Cl. 75—.5 AC **7 Claims**



The dispersions are characterised by the fact that the particles of single or mixed nitrides are distributed uniformly in the midst of the selected base metal or alloy. To manufacture these dispersions a mixed oxide, a coprecipitate of hydroxides or a mixed complex of a first metal providing the nitride and of a second metal providing the base metal are subjected to a heat treatment in an enclosure in an atmosphere simultaneously reducing and nitriding of hydrogen and ammonia or nitrogen. The heat

treatment is carried out at less than 1100° C. to which the starting materials are brought at a speed of 100 to 400° C./hour. These dispersions are used in conventional techniques of powder metallurgy.

3,704,117

PROCESS FOR DECOMPOSING INTERMETALLIC COMPOUNDS IN METALS

Alex R. Valdo, Baton Rouge, La., and Freeman M. Sanderford, Dalton, Ga., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of appplication Ser. No. 744,307, July 12, 1968. This application July 21, 1971, Ser. No. 164,952

Int. Cl. B22d *23/08*

U.S. Cl. 75—.5 C 8 Claims

A process for at least partially decomposing intermetallic compounds in metal and metalloid-containing alloys. The invention is characterized by heating the alloy to a temperature at least as high as the melting temperature of the intermetallic compound but below the melting temperature of at least one of the metals or metalloids in the alloy for a period of time sufficiently long to thermally dissociate at least a portion of the intermetallic compound and then rapidly cooling the alloy to minimize re-formation of the dissociated compound by blowing the melt.

3,704,118

COBALT-VANADIUM-IRON ALLOY

Carl P. Stroble, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 47,127, June 17, 1970. This application Dec. 27, 1971, Ser. No. 212,702

Int. Cl. C22c *19/00*

U.S. Cl. 75—170 4 Claims

Described herein is an improved alloy possessing an outstanding combination of strength and electrical properties which consists essentially of cobalt, vanadium, molybdenum and iron and in which the molybdenum is limited to 0.25 to 1% with a combined vanadium plus molybdenum content of 1.5 to 2.5%.

3,704,119

ELECTROPHOTOGRAPHIC PROCESS USING TONER OF SAME REFRACTIVE INDEX AS ORGANIC PHOTOCONDUCTIVE LAYER

Satoru Honjo, Syu Watarai, and Hisatake Ono, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed July 31, 1970, Ser. No. 60,116

Claims priority, application Japan, Aug. 7, 1969, 44/62,016

Int. Cl. G03g *13/08, 13/22*

U.S. Cl. 96—1 R 7 Claims

A method for making electrophotographic reproductions which comprises the first step of forming an electrostatic latent image on an organic photoconductive layer which includes component materials of substantially equal reflective indices, and which includes light scattering inner surfaces homogeneously throughout its thickness or near the surface of the layer whereby the layer has an opaque appearance. The latent image is then developed according to any of the known electrophotographic development procedures, thus converting the latent image into a toner image, which decreases the light-scattering property of the organic photoconductive layer when impregnated into the layer. The toner deposited area of the layer is then made more transparent than the remaining areas by the action of heat and/or a solvent for the toner.

3,704,120

METHOD OF MULTIPLE TRANSFER OF LATENT ELECTROSTATIC IMAGES

Horst Kosche, 14 Holzstrasse, 516 Duren, Germany

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,607

Int. Cl. G03g *13/18, 13/22*

U.S. Cl. 96—1 R 21 Claims

An electromagnetographic method of printing comprises generating a latent electrostatic or magnetic image on an image carrier which is not magnetizable but is electrically conductive. A magnetizable, electrically conductive powder is applied to develop the image and the developed image is fixed on the carrier by aid of a substantially uniform magnetic field, which holds the magnetizable particles in place. While so held in place, the image particles are charged and brought into contact with an image receiving material. The charge on the magnetized particles induces a charge on the image-receiving material corresponding to the image. The charged image-receiving material is then removed and the image developed and fixed in the known manner as by use of a triboelectric toner. The magnetically-fixed master image may be recharged and used repeatedly for generation of electrostatic image charges on image carrier material; when the required number of images have been produced, the master image is removed by removing the magnetic field and brushing or blowing away the particles.

3,704,121

ELECTROPHOTOGRAPHIC REPRODUCTION PROCESS USING A DUAL LAYERED PHOTORECEPTOR

Katsuo Makino, Yoshihiko Yamada, and Jun Onozaki, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sept. 19, 1969, Ser. No. 859,333

Claims priority, application Japan, Sept. 21, 1968, 43/68,510

Int. Cl. G03g *5/00*

U.S. Cl. 96—1 7 Claims

Process of electrophotography using a photosensitive member having two photoconductive layers, at least a portion of the range of the spectral sensitivity of the one photoconductive layer being different from at least a portion of the range of the spectral sensitivity of the other photoconductive layer comprising the steps of applying electrostatic charges having opposite polarities in any desired pattern to a surface of one of the two photoconductive layers and to the boundary between the above described two photoconductive layers or a region adjacent thereto, respectively, thereby forming an electrostatic field in the above-mentioned one photoconductive layer, applying mobile electric charges to the above-mentioned one photoconductive layer while it is exposed to a light bearing therein an image to be recorded, the light being of such characteristics that the above-mentioned one photoconductive layer is not rendered substantially photoconductive while the other photoconductive layer is rendered to phoconductive, thereby discharging the electrostatic charges in both faces of the above-mentioned one photoconductive layer according to the photoconductivity of the other photoconductive layer substantially through the other photoconductive layer and the mobile electric charges by virtue of the electrostatic field in the above described one photoconductive layer and an external voltage so as to form an electrostatic latent image in the above described one photoconductive layer, and exposing the above-mentioned one photoconductive layer to a light consisting of spectral components which render the above-described one photoconductive layer to be photoconductive so that the latent image is erased after it has been utilized.

3,704,122

ELECTROPHOTOGRAPHIC PLATE COMPRISING A PHOTOCONDUCTOR DISPERSED IN A RESIN BINDER

Nario Yamaguchi, Sakae Shimizu, and Kazuo Tubuko, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Continuation of abandoned application Ser. No. 780,282, Nov. 29, 1968. This application June 10, 1971, Ser. No. 151,926

Claims priority, application Japan, Dec. 6, 1967, 42/77,946, 42/77,947; Dec. 12, 1967, 42/79,629; Dec. 23, 1967, 42/82,581; Dec. 27, 1967, 43/83,736

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.8 **6 Claims**

An electrophotographic copying material comprising a support and a light-sensitive or photoconductive layer formed on one surface of said support by a resinous binder, wherein said photoconductive layer contains a photoconductive substance and is formed by a series of steps of (1) dispersing said photoconductive substance in an aqueous emulsion prepared by emulsifying a synthetic film-forming resin or a natural film-forming resin in an aqueous emulsifier solution containing a volatile basic compound and an acidic compound thereafter (2) coating the resultant emulsion containing dispersed photoconductive substance on said support, and then drying the coated support.

3,704,123

DYE SENSITIZED PHOTOCONDUCTIVE MATERIAL

Katsuo Makino and Iwao Sawato, Minami-Ashigara Machi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of abandoned application Ser. No. 720,935, Apr. 12, 1968. This application May 10, 1971, Ser. No. 142,081

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.6 **16 Claims**

A photoconductive material formed from the admixture of a fine powder of cadmium carbonate and cadmium sulfide with a dyestuff capable of absorbing radiation energy and transmitting it to said fine powder and wherein said admixture may additionally include iodine or an iodine-containing compound.

3,704,124

DIAZO-CONTAINING MATERIAL EXHIBITS AN IMAGEWISE CHANGE IN TRIBOELECTRIC CHARGING PROPERTIES

Dale H. Conant, 32 Kings Court Way, Rochester, N.Y. 14617

No Drawing. Filed June 30, 1970, Ser. No. 51,352

Int. Cl. G03g *5/02, 13/14, 13/22*

U.S. Cl. 96—1 R **12 Claims**

Visible images corresponding to latent electrostatic charge images are produced on photographic layers incorporating a radiation-sensitive diazo material, such as a diazonium salt or a diazo resin, which exhibits a change in triboelectric series position upon exposure to activating rays, by means of a photographic process which includes (a) imagewise exposing the photographic layer to electromagnetic radiation capable of effecting an exposed imagewise change in triboelectric series position, (b) differentially triboelectrically charging the surface of the exposed photographic layer imagewise to form a latent electrostatic image thereon and (c) developing the latent electrostatic image by contacting the charged surface with a developer composition containing electrostatically attractable toner particles, to form a pattern of the toner particles on the charged surface corresponding to the non-exposed or the exposed regions. The inclusion of at least one surface active agent, such as alkali metal or ammonium alkyl sulfonate, alkali metal or ammonium sulfonated alkyl carboxylate esters, alkali metal or ammonium aryl sulfonates or alkylamines, in the photographic layer promotes not only ease of coating, but also an enhanced developed image density.

3,704,125

COLOR PROCESS

Arthur Donald Ketley, Columbia, Clifton Leroy Kehr, Silver Spring, and Jennie Lee Touchette, Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Original application Oct. 11, 1968, Ser. No. 766,948, now Patent No. 3,623,879. Divided and this application July 15, 1971, Ser. No. 163,080

Int. Cl. G03c *7/16, 7/00, 7/68*

U.S. Cl. 96—14 **3 Claims**

This invention is directed toward forming a silverless continuous tone photographic image having a scale index between 0.5 and 1.5 and a gamma of 0.5–1.5 (see "Kodak Notes on Practical Densitometry," Pamphlet No. E59, pages 1–17 Eastman Kodak Company, Rochester, N.Y., for definitions) from a supported pigment or dye filled liquid photosensitive composition by selectively insolubilizing portions of the composition on exposure to actinic radiation and removing the unexposed liquid portion of the composition from the support.

3,704,126

SILVER IMAGE STABILIZATION WITH NOBLE METAL COMPOUNDS

Edwin H. Land, Cambridge, Stanley M. Bloom, Waban, and Leonard C. Farney, Melrose, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 7, 1970, Ser. No. 95,424

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 R **56 Claims**

The present invention relates to a photographic silver diffusion transfer process which comprises, in essence, exposing a silver diffusion transfer film unit which comprises photosensitive silver halide and silver precipitating nuclei; contacting the exposed film unit with a processing composition which comprises a silver halide developing agent and a silver halide solvent to provide a visible silver image to the unit, as a function of exposure; and coacting the silver image with a noble metal below silver in the Electromotive Force Series of Elements at a concentration effective to enhance stability of a silver image provided by diffusion transfer processing of the film unit.

3,704,127

CO-IRRADIATION METHOD FOR PRODUCING POSITIVE IMAGES UTILIZING PHOTOTROPIC SPIROPYRAN OR INDENONE OXIDE OR DUAL RESPONSE PHOTOSENSITIVE COMPOSITION

Rolf Dessauer, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 880.301, Nov. 26, 1969. This application Aug. 17, 1970, Ser. No. 64,220

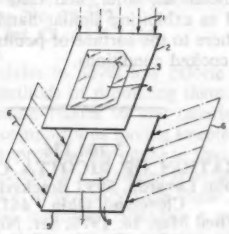
Int. Cl. G03c *5/24*

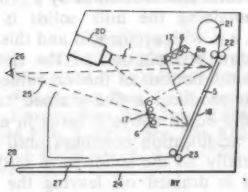
U.S. Cl. 96—48 **8 Claims**

Method for producing positive images by irradiating photosensitive compositions which are characterized by forming color on irradiation with light in a first wavelength range and by being prevented from forming color

on irradiation with light in a different second wavelength range. The method comprises simultaneously exposing such composition disposed as an image-capture surface to radiations in both wavelength ranges, with

(1) the color-preventing radiation being applied pattern-wise according to the desired image to be captured,
(2) the color-forming radiation being applied over the entire surface to be imaged, and
(3) the intensities and the relative intensities of the two radiations being such that
  (i) the color-preventing radiation is itself effective for color-preventing and
  (ii) the color-forming radiation is itself effective to cause color formation in other than the co-struck areas but is ineffective in the presence of the color-preventing radiation in the co-struck areas to cause substantial color formation.





A preferred composition for use with this method is a mixture of

(A) color forming components which are responsive to said first wavelength range and thereby produce a first photo-induced oxidation-reduction reaction, and
(B) deactivating components which are responsive to said second wavelength range and thereby produce a deactivating agent by a second oxidation-reduction reaction, said deactivating agent thus produced being a stronger reducing agent than the reductant member of the color-forming components and thereby preventing the color-forming reaction when the composition is subsequently exposed to the first wavelength range.

Another useful photoimageable system includes photochromic compounds, e.g., the spiropyrans, which form color on being exposed to light of one wavelength range and which revert to the original color on being exposed to light of a second wavelength.

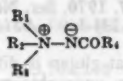
3,704,128

N-YLIDE COMPOUNDS AS ANTISTATIC AGENTS IN PHOTOGRAPHY

Ken'Ichi Koda, Shoji Kikuchi, Tsuneo Wada, Yoshimi Kuwabara, Akira Horikoshi, and Kensaku Tanimura, Tokyo, and Sadao Sugita, Hanno, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,714
Claims priority, application Japan, Mar. 14, 1969, 44/18,909
Int. Cl. G03c *5/26, 1/02*
U.S. Cl. 96—50 **5 Claims**

A new use, as an antistatic agent for light-sensitive silver halide photographic material, of an N-ylide represented by the general formula



wherein R_1, R_2 and R_3 are individually an alkyl group, an aralkyl group or a group derived from any of said groups, and R_4 is an alkyl group, an aryl group or a hetero ring.

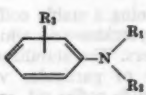
3,704,129

TWO COMPONENT DIAZOTYPE COMPOSITION HAVING ADDITIONALLY AN ANILINE COMPOUND

Henri G. J. de Boer and Thomas Brooshooft, Delft, and Anton Wemmers, den Hoorn, Holland, assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,428
Int. Cl. G03c *1/58, 1/60*
U.S. Cl. 96—91 R **9 Claims**

A light-sensitive diazotype material comprising a light-sensitive diazonium salt, an organic coupling component and an aromatic amine of the general formula



where R_1 and R_2, which are the same or different, can be hydrogen, alkyl, hydroxyalkyl, aryl, substituted aryl, aralkyl or substituted aralkyl but R_1 and R_2 cannot both be hydrogen and R_3 can be halogen or the same as R_1 and R_2.

3,704,130

PHOTOGRAPHIC FINE GRAIN SILVER HALIDE EMULSIONS

Robert Joseph Pollet, Vremde, Herman Adelbert Philippaerts, Mortsel, Jozef Frans Willems, Wilrijk, and Frans Henri Claes, Edegem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Oct. 2, 1970, Ser. No. 77,695
Claims priority, application Great Britain, Oct. 29, 1969, 53,025/69
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.7 **14 Claims**

A process of preparing fine-grain light-sensitive silver halide emulsions of the Lippmann type is described wherein precipitation of the silver halide grains occurs in the presence of a compound of the formula:

Z—A—X

wherein each of Z and X stands for a heterocycle comprising the moiety =N— and A represents a chemical bond, alkylene, alkylene interrupted by oxygen or —N(R)—, R being hydrogen or C_1–C_4 alkyl, arylene, alkenylene or —S-alkylene-S— or —S-alkylene— the alkylene groups of which may be interrupted by oxygen or the group

—N(R)—. The average silver halide grain size can be reduced to less than 50 nm. The emulsions show a high diffraction efficiency and a high signal to noise ratio.

3,704,131

READILY DISPERSIBLE DRY GLUTEN PRODUCT, PROCESSES FOR MAKING IT, AND USES THEREOF

Richard J. Hampton, Pierrefonds, Quebec, Jacques R. Rolland, Longueil, Quebec, and Thomas Gallo, Toronto, Ontario, Canada, assignors to The Ogilvie Flour Mills Company, Limited, Montreal, Quebec, Canada

Filed Apr. 7, 1970, Ser. No. 26,405
Int. Cl. A23j *3/00*; A21d *2/36*
U.S. Cl. 99—17 **2 Claims**

Powdered vital wheat gluten is difficult to disperse in water and a dispersion, once obtained, is unstable since individual particles readily coalesce with the formation of an intractable, lumpy mass. By converting the powdered gluten into novel structures in the form of agglomerates thereof under conditions which do not denature the gluten, the gluten can be readily wetted out and dispersed in water to form a relatively stable dispersion. Accordingly, the agglomerated gluten is ideally suited for the manufacture of yeast-leavened bakery products, especially by continuous dough-making processes.

3,704,132

PURIFICATION OF COFFEE OIL AS A STABLE COFFEE AROMA CARRIER

Rudolf G. K. Strobel, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 19, 1971, Ser. No. 126,305
Int. Cl. A23f *1/04*
U.S. Cl. 99—65 **5 Claims**

A method of obtaining a stable coffee oil which comprises primarily triglycerides and which is substantially free of diterpene esters. The stabilized coffee oil is obtained by utilization of particular vacuum distillation conditions to distill crude coffee oil, and to yield vacuum distilled coffee oil which is substantially diterpene ester-free and resistant to oxidation and rapid rancidity development.

3,704,133

POPCORN PRODUCT

Paul Kracauer, 210 W. 90th St., New York, N.Y. 10024

No Drawing. Filed June 8, 1970, Ser. No. 44,620
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 **9 Claims**

The invention relates to a new product of corn kernels which upon popping in the ordinary manner, i.e. a closed container, results in popcorn which is uniformly flavored, e.g. with shortening and salt, with sugar, with candy flavor or with cheese. This is accomplished by mixing the corn kernels with shortening, a lipophilic surfactant and with water prior to the popping.

3,704,134

PROCESS FOR PREPARING AN INSTANT OAT CEREAL

Kenneth S. Ronai, Ridgewood, and Henry C. Spanier, Dumont, N.J., assignors to Nabisco, Inc., New York, N.Y.

No Drawing. Filed July 23, 1970, Ser. No. 57,763
Int. Cl. A23l *1/10*
U.S. Cl. 99—83 **5 Claims**

An instant oat cereal product, requiring little or no cooking is prepared by adding to processed oats, a pregelatinized starch component as a texturizing agent and a process for its preparation.

3,704,135

METHOD OF PREPARING A FABRICATED SKIN FROM POULTRY MEAT AND SKIN AND PRODUCT PRODUCED THEREBY

Douglas Hale, St. Louis, Mo., James C. Manuel, Belleville, Ill., and Nicholas R. Beck, Chamblee, Ga., assignors to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 759,510, Sept. 12, 1968. This application Feb. 8, 1971, Ser. No. 113,745
Int. Cl. A22c *21/00*
U.S. Cl. 99—108 **11 Claims**

Poultry skin and edible poultry by-products are formed into a resultant matrix having some coarse particle sizes therein preferably by a chopping operation. A predetermined quantity of the matrix is then subjected to heat and pressure which flattens the matrix into a sheet having a desired shape and thickness. The heat is applied to the matrix for a sufficient period of time to partially coagulate or coagulate at least the surface protein of the matrix while it is under pressure. The resultant product resembles the looks, color, and taste of natural poultry skin as well as exhibiting similar handling characteristics and will adhere to the surface of poultry products in both frozen and cooked conditions.

3,704,136

PREPARATION OF RICOTTA CHEESE CURD

John Lavarda, 5999 Brecksville Road, Cleveland, Ohio 44131

Filed Mar. 16, 1970, Ser. No. 19,939
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 **23 Claims**

A soft curd ricotta cheese is made by a process wherein the mixture containing the milk solids is heated and slowly acidified, e.g. with acetic acid and this slow acidification causes slow precipitation of the ricotta curd so that it settles to the bottom of the vat rather than rising to the top. This produces a fine grained curd which is kept sterile by the liquid above it being in excess of 140 degrees F. The acidification continues until the liquid is clear and essentially all the solids have settled and then the clear liquid is drained off leaving the ricotta curd ready for use.

3,704,137

ESSENTIAL OIL COMPOSITION AND METHOD OF PREPARING THE SAME

Eugene E. Beck, 217½ Ellsworth Ave., Anaheim, Calif. 92805

Filed June 11, 1970, Ser. No. 45,287
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 R **2 Claims**

A relatively stable, non-crystallizable essential oil composition in finely divided, rod-like particulate form, and a method of producing such a composition from an aqueous mixture of sucrose, hydrolyzed cereal solids having a dextrose equivalent (DE) of less than about 20, and preferably between 10 and 15, and an emulsifier. An aqueous mixture of the sucrose, hydrolyzed cereal solids and an emulsifier is subjected to agitation and to heating at boiling temperatures until the boiling point of the mixture is at about 122° C. The resulting emulsion is then cooled to about 114° C., while mixing therewith the desired essential oil, either with added emulsifier or with sufficient emulsifier present to form a homogeneous melt. The melt is then extruded into a relatively cool liquid solvent, such as isopropanol, to form the melt into rods and to wash

off any excess of essential oil from the surface of said rods. Thereafter, the rods are subjected to centrifugal action to remove the excess liquid solvent. Prior to final drying of the rod-like particles, an inert finely divided silica, such as a pyrogenic silica, is mixed with the broken up rods and the mixture then subjected to screening and final drying to produce a particulate essential oil composition in the form of fine rod-like particles having little or no tendency to stick together due to the admixture of the siliceous inert material. In the final screening and drying steps any overly fine and overly coarse particles of the pyrogenic silica and/or of the particulate essential oil composition are screened out of the product before the same is packed into containers for storage and subsequent use.

3,704,138

LOW-CALORIE SWEETENING COMPOSITION AND METHOD OF PRODUCING THE SAME

Anthony Laurence La Via, East Brunswick, and Richard Lawrence O'Laughlin, Jamesburg, N.J., and Richard Wiegmann Walton, Langhorne, Pa., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 650,659, July 3, 1967. This application Sept. 17, 1970, Ser. No. 73,252

Int. Cl. A23l *1/26*

U.S. Cl. 99—141 A **5 Claims**

This invention relates to novel low calorie sweetening compositions and methods of producing them. More particularly, this invention relates to low calorie, low bulk density sweetening compositions having sweetening power on a volume basis approximately equal to that of sucrose, and which is in the form of a granular free-flowing solid, similar in appearance to ordinary cane sugar. The novel compositions of this invention comprise a combination of hydrolyzed corn starch, arabinogalactan and artificial sweeteners.

3,704,139

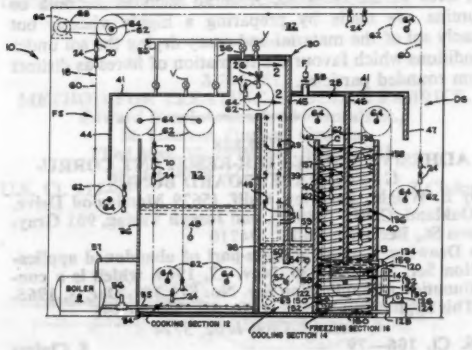
COOKING AND FREEZING PRODUCTS IN FLEXIBLE CONTAINERS

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 3, 1971, Ser. No. 112,194

Int. Cl. B65b *55/14*; A23l *3/36, 3/02*

U.S. Cl. 99—192 R **13 Claims**



A method and apparatus for continuously heat treating food filled flexible containers by stretching each container across its open mouth to provide a one-way valve therein and to then cook or blanch the product retaining the product and all liquids and solids emitting therefrom within the container while allowing only gases to escape from the containers during the cooking step. After cooking, the mouth of the flexible container or pouch is sealed, the pouch is cooled in water and, after being dried, is thereafter moved through a freezing zone for quickly freezing the contents of the pouch. The method provides a product in the form of a boil-in-the-bag pouch having a low headspace and a frozen food product therein which is high in nutritional value. Since the heat treatment fluids used during cooking, cooling, and freezing are not contaminated by the food product, these fluids are recirculated for reuse.

3,704,140

STERILISATION OF TINS

Maurice Petit, Paris, and Georges Thomas, Ville-d'Avray, France, assignors to Ets J. J. Carnaud & Forges de Basse-Indre, Paris, France

Filed Dec. 19, 1969, Ser. No. 886,585

Claims priority, application France, Dec. 30, 1968, 181,852

Int. Cl. A23l *3/02*

U.S. Cl. 99—214 **9 Claims**

To prevent bursting of a can due to the vacuum formed therein on cooling after sterilisation a part of the can, generally an end thereof, is subjected to a permanent deformation, effected before the can is fully cooled, which reduces the internal volume of the can.

3,704,141

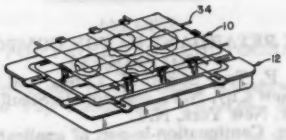
VARIABLE CAPACITY BROILING EQUIPMENT

Sidney Grossman, 180 Samoset Ave., Quincy, Mass. 02121

Filed Sept. 15, 1970, Ser. No. 72,439

Int. Cl. A47j *37/04*

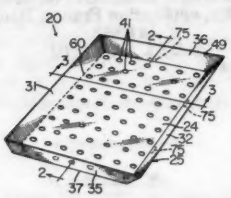
U.S. Cl. 99—397 **1 Claim**



A variable capacity broiling rack is provided in combination with a cooperating broiling pan and a detachable handle for periodically turning the rack in the pan. The

rack is provided with articulated grid work panels connected by extensible spring hinges and secured in the closed position with food therebetween by means of extensible spring latches. Outwardly extending supports seat in cooperating grooves formed in the pan. The handle is provided with a pair of spaced hook-like members for grasping the rack.

3,704,142
COOKING PAN HAVING ARTICLE-SUPPORTING WALL ABOVE BOTTOM WALL
Calvin L. Wilson, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Continuation-in-part of application Ser. No. 844,442, July 24, 1969. This application Jan. 24, 1972, Ser. No. 220,275
Int. Cl. A47j *36/20*
U.S. Cl. 99—446 **15 Claims**



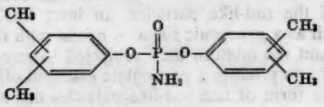
A disposable cooking pan which is particularly adapted for broiling food products is provided and such pan has metallic foil defining practically its entire exposed inside and outside surfaces. The pan has an article-supporting wall arranged above a bottom wall with a space provided therebetween for collecting juice, or the like, exuding from a product contained in the pan and the article-supporting wall has means for absorbing such juice. An improved apparatus for and method of making the article-supporting wall are also presented herein.

3,704,143
AEROSOL SPRAY POLISH
Milton Nevitt, New Hyde Park, N.Y., assignor to Spray 'N Shine Incorporated, Wilmington, Del.
No Drawing. Filed Oct. 14, 1971, Ser. No. 189,398
Int. Cl. C09g *1/10*
U.S. Cl. 106—5 **5 Claims**

An aerosol spray shoe polish that is wax and silicone free. Ethyl cellulose is used as a base. A plasticizer is employed as is three solvents having different boiling points for providing high gloss, no wax build-up solubility of previous coatings, and dispersal of previously applied wax.

3,704,144
FLAME RETARDANT RAYON COMPOSITION AND PROCESS
Arthur D. F. Toy, Stamford, Conn., and Edward N. Walsh, New City, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 737,354, June 17, 1968. This application Jan. 20, 1971, Ser. No. 108,203
Int. Cl. C09d *5/18*; C08b *21/20*
U.S. Cl. 106—15 FP **4 Claims**

A process for spinning synthetic fibers, such as rayon, consisting of incorporating therein a fire retardant composition of matter consisting essentially of a dixylyl phosphoramidate having the formula:



wherein the methyl radicals may be attached to any of 2, 3, 4, 5 or 6 positions.

3,704,145
INVESTMENT CASTING WAX
Richard E. Ware, Trainer, and John C. Merges, Jr., Glen Mills, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
No Drawing. Filed May 3, 1971, Ser. No. 139,818
Int. Cl. B28b *7/34*; C08h *9/06*
U.S. Cl. 106—38.7 **20 Claims**

An improved investment casting wax composition consisting essentially of about 35–65 weight percent refined petroleum wax, solid chlorinated polyphenyl, certain ester type montan waxes, Fischer-Tropsch wax, and a metal soap. Said composition has the advantage of low shrinkage, low penetration and rapid setup.

3,704,146
CERAMIC WHITEWARE COMPOSITIONS COMPRISING A BORATE FLUX
Joseph Dulat, Fetcham, England, assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.
No Drawing. Filed Dec. 2, 1969, Ser. No. 881,577
Claims priority, application Great Britain, Dec. 3, 1968, 57,372/68
Int. Cl. C04b *33/00*
U.S. Cl. 106—45 **1 Claim**

Flux for ceramic compositions having 30–60% B_2O_3, 20–60% SiO_2, 5–30% CaO and/or MgO and 0–15% Na_2O.

3,704,147
FIBROUS INORGANIC MATERIALS
Clarence James Hardy, Wantage, and Michael Joseph Holdoway, Abingdon, England, assignors to United Kingdom Atomic Energy Authority, London, England
No Drawing. Filed Apr. 30, 1970, Ser. No. 33,514
Claims priority, application Great Britain, May 6, 1969, 23,174/69
Int. Cl. C04b *31/04*
U.S. Cl. 106—55 **9 Claims**

Fibres of an inorganic material such as zirconia or alumina are made by preparing a highly viscous but treacly sol of the material and spray drying the sol under conditions which favour the formation of fibres as distinct from rounded particles.

3,704,148
ADHESIVE FOR WATER-RESISTANT CORRUGATED PAPERBOARD BONDS
Roy E. Wright, Berkeley, Calif. (5679 Merriwood Drive, Oakland, Calif. 94611), and Joseph Vastag, 901 Grayson St., Berkeley, Calif. 94710
No Drawing. Continuation-in-part of abandoned application Ser. No. 871,536, Nov. 17, 1969, which is a continuation of application Ser. No. 511,359, Dec. 3, 1965. This application Nov. 5, 1970, Ser. No. 87,351
Int. Cl. C09j *1/02, 3/24*
U.S. Cl. 106—79 **5 Claims**

This invention is an improvement in the art of water-resistant adhesives used in the manufacture of corrugated paperboard. These adhesives are composed of soluble silicates, soluble blood protein, and a small amount of a simple dialdehyde which controls the gelation temperature of the adhesive between about 37° and 55° C.

3,704,149

LIQUID BINDING AGENT FOR BONDED ARC WELDING FLUX

William T. Delong, Spring Garden Township, York County, Edwin R. Szumachowski, Springettsbury Township, York County, and Harold R. Heverly, Straban Township, Adams County, Pa. (all % The McKay Company, 1005 Liberty Ave., Pittsburgh, Pa. 15222)

No Drawing. Original application Oct. 13, 1970, Ser. No. 80,507. Divided and this application Dec. 20, 1971, Ser. No. 210,144

Int. Cl. C08h *17/24*

U.S. Cl. 106—286 4 Claims

Liquid binding agent for bonded arc welding flux consisting essentially of a uniform aqueous mixture of the following listed finely divided ingredients in the specified weights per 100 cc. of water: alkali metal aluminate of the class consisting of sodium aluminate and potassium aluminate, 5 to 40 grams; lithium fluoride, 3 to 30 grams; material of the class consisting of sodium fluoride and potassium fluoride, 2 to 25 grams.

3,704,150

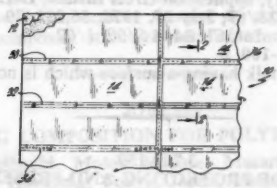
CORRECTION MATERIAL HAVING VISUAL ALIGNING MEANS

Victor Barouh, 935 Plum Tree Road, Westbury, N.Y. 11590, and Robert Glenn, 70—20 108th St., Forest Hills, N.Y. 11375

Filed Jan. 25, 1971, Ser. No. 109,457

Int. Cl. B41m *5/10*

U.S. Cl. 117—2 TC 4 Claims



A material for correcting errors of any type of indicia and particularly typewritten errors. The correction material comprises a light-transmitting base sheet upon which are provided rectangular coatings of a composition, a portion of which is readily fractured from the base sheet and integrally bondable to the material to be corrected. The base sheet is perforated or serrated between coatings to facilitate alignment of the indicia with a coating.

3,704,151

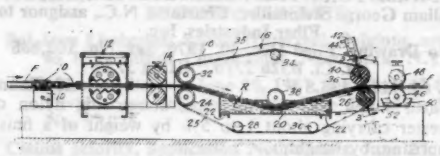
METHOD FOR TREATING TUBULAR FABRICS

Edward Israel Aronoff, 605 Dorais St., St. Laurent, Quebec, Canada

Filed Mar. 30, 1970, Ser. No. 19,591

Int. Cl. B05c *3/103;* D06c *5/00*

U.S. Cl. 117—7 7 Claims



A process for impregnating tubular knit fabrics which includes the steps of continuously advancing the knitted fabric having a predetermined loop geometry, passing the fabric in a flattened condition between a pair of opposed moving contacting porous surfaces to support and maintain the loop geometry of the fabric, advancing the pair of porous surfaces, while pressing the fabric, through a liquid treating bath whereby the fabric is impregnated with liquid while the loop geometry is maintained, withdrawing the fabric from the bath and from between the porous surfaces and removing the excess liquid from the fabric, as it is withdrawn from the bath.

3,704,152

MAGNETIC RECORDING MEDIA

Hans Joerg Hartmann, Wachenheim, Georg Schnell, Ludwigshafen, Gerhard Werst, Neustadt, Horst Grosselfinger, Mannheim, Job-Werner Hartmann, Ludwigshafen, and Hansjoerg Bipp, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,260

Int. Cl. H01f *10/02*

U.S. Cl. 117—235 6 Claims

Magnetic recording media comprising a non-magnetic support and a magnetic layer based on a magnetic pigment dispersed in a binder and containing a small amount of a liquid mixture of branched fatty acids having at least 95% by weight of C_{12} to C_{18} fatty acids and at least 40% by weight of branched C_{18} fatty acids.

3,704,153

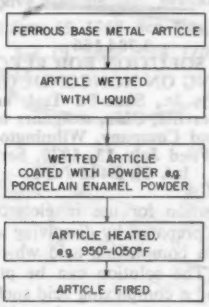
PROCESS FOR ENAMELING FERROUS ARTICLES

Jerome J. Kanter, Palos Park, Ill., assignor to Crane Co., Chicago, Ill.

Continuation of applications Ser. No. 624,905, Mar. 21, 1967, and Ser. No. 654,438, July 19, 1967. This application May 9, 1969, Ser. No. 823,319

Int. Cl. C23d *5/00*

U.S. Cl. 117—23 14 Claims


FERROUS BASE METAL ARTICLE
ARTICLE WETTED WITH LIQUID
WETTED ARTICLE COATED WITH POWDER e.g. PORCELAIN ENAMEL POWDER
ARTICLE HEATED, e.g. 950°-1050°F
ARTICLE FIRED

The process relates to improvements in the enameling of ferrous articles. The surfaces to be enameled are wetted with a liquid and enamel powder is supplied to the wetted surfaces to form a bisque. The bisque is baked, and the articles thereafter fired.

3,704,154

PROCESS FOR PRODUCING PHOTOGRAPHIC MATERIALS

Sumitaka Tatsuta and Wataru Ueno, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Feb. 18, 1971, Ser. No. 116,625

Claims priority, application Japan, Feb. 20, 1970, 45/14,938

Int. Cl. B41m *5/14;* G03c *1/76*

U.S. Cl. 117—34 4 Claims

A process for producing photographic materials comprising contacting a bi-axially stretched polystyrene sup-

port with a liquid containing at least a solvent or swelling agent for said polystyrene and gelatin dispersed therein, contacting the support with a non-solvent for said polystyrene to prepare a white opaque polystyrene support having a hydrophilic surface, and applying an emulsion or suspension containing gelatin to said support, is disclosed.

3,704,155
THERMOGRAPHIC STENCIL SHEET AND METHOD OF MAKING AN IMAGED STENCIL SHEET

Bror E. Anderson, Arlington Heights, and Margery L. Schick, Mount Prospect, Ill., assignors to Weber Marking Systems, Inc., Arlington Heights, Ill.

No Drawing. Continuation-in-part of application Ser. No. 674,153, Oct. 10, 1967. This application Apr. 9, 1970, Ser. No. 27,135
Int. Cl. B41m *1/24*
U.S. Cl. 117—35.5 **10 Claims**

A thermographic stencil sheet which may be imaged by heat generated by infrared ray absorption with but low oil transfer to an adjacent original includes an ink-pervious base sheet and an ink-impervious coating thereon of a heat-flowable composition of cellulose acetate butyrate film-forming material and plasticizing material partially but incompletely compatible with the film-forming material, the composition being characterized by forming a cooled melt having a defined pourable liquid volume, and the plasticizing material being characterized by defined tack and aniline point limits. The stencil sheet may be imaged by exposing an original in contact with the sheet to infrared radiation to generate heat in the image areas of the original sufficient to render the composition flowable in the image areas of the stencil sheet, and causing the composition to flow from the image areas to thereby form corresponding ink-transmitting openings in the stencil sheet.

3,704,156
CATALYST SOLUTION FOR ELECTROLESS PLATING ON NONCONDUCTORS

Edward F. Foley, Jr., Shan-Pu Tsai, and William A. Zatorsky, Painesville, Ohio, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 13, 1970, Ser. No. 54,571
Int. Cl. B44d *1/18*
U.S. Cl. 117—47 A **14 Claims**

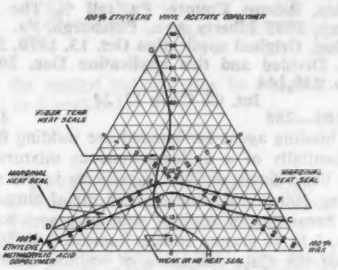
A catalyst solution for use in electroless plating on nonconductors is prepared by dissolving a palladium salt in a solution of a complexing acid which forms monodentate ligands. The solution can be prepared using a palladium salt and a complexing acid such as acetic acid, monochloracetic acid, bromoacetic acid, dichloroacetic acid, trichloroacetic acid, glycollic acid, phosphoric acid and 1,3,5-pentanetricarboxylic acid.

3,704,157
COATED ARTICLE AND METHOD OF MAKING SAME

John William McDonald, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 23, 1970, Ser. No. 91,849
Int. Cl. C09j *7/04*
U.S. Cl. 117—68.5 **16 Claims**

A sheet material having heat seal properties including improved hot tack is provided by coating a paper sheet substrate with a mixture comprising (A) a copolymer of ethylene and a vinyl alkanoate and from 0 to about 10% of an alpha, beta-ethylenically unsaturated carboxylic acid, and (B) a copolymer of ethylene and an alpha, beta-ethylenically unsaturated carboxylic acid in which the carboxylic acid groups are neutralized to a predetermined extent, and, in the preferred embodiment (C) wax. A method for making the sheet material is also provided



utilizing an aqueous dispersion of the stated mixture having a pH of at least 9 and preferably from about 10 to about 11.

3,704,158
TREATMENT OF POWDERED CHALK

George Alexander Rohan, Windsor House, Esher, England

No Drawing. Filed Dec. 3, 1970, Ser. No. 94,940
Claims priority, application Great Britain, Dec. 4, 1969, 59,335/69; July 27, 1970, 36,222/70
Int. Cl. B44d *5/00, 1/02*
U.S. Cl. 117—100 B **8 Claims**

Powdered chalk having a surface which is non-reactive with acids.

3,704,159
METHOD OF PROTECTING AND PRESERVING STONE OBJECTS

Edward Vale Sayre, Bellport, N.Y., assignor to New York University, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 860,012, Sept. 22, 1969. This application Apr. 30, 1971, Ser. No. 139,269
Int. Cl. C03c *17/00*
U.S. Cl. 117—123 A **15 Claims**

Process for preserving stone objects made of limestone, sandstone, or the like and containing at least 5 percent by weight of $CaCO_3$. Comprises contacting the stone with an aqueous solution of a barium or strontium salt of a monoester of sulfuric acid and then hydrolyzing at a pH not less than about 7, so as to precipitate barium or strontium sulfate in a slow, controlled manner and thereby effect consolidation of the stone.

3,704,160
FINISH FOR NYLON OR POLYESTER ROPE

William George Steinmiller, Charlotte, N.C., assignor to Fiber Industries, Inc.

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,888
Int. Cl. B32b *27/02*; C10m *3/20*
U.S. Cl. 117—138.8 F **12 Claims**

Yarn, suited for making rope, comprising nylon or polyester carrying about 1 to 5% by weight of a finish comprising, by weight,

(a) about 5 to 25% of a described tri-fatty acid ester of a cross-linked, tetra-alkyl, hydroxy substituted furan or pyran,

(b) about 1 to 5% of a metallic fatty acid soap, and

(c) about 70 to 90% of an oil carrier.

3,704,161

PRODUCTION OF WOOD-PLASTICS COMPOSITE STRUCTURES

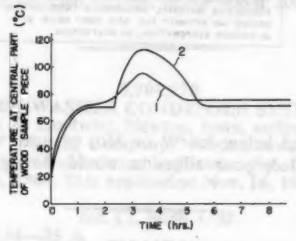
Yasuju Yamaguchi and Yujiro Nakayama, Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

Filed Dec. 3, 1970, Ser. No. 94,888

Claims priority, application Japan, Dec. 4, 1969, 44/97,728

Int. Cl. B27k *3/36;* B44d *1/28*

U.S. Cl. 117—148 9 Claims



At least one compound selected from ester compounds and polyalkylene glycol compounds (e.g., methylethyl glycolate) is added to and dissolved in a vinyl monomer, which is then used to impregnate a wood matrix and caused to polymerize by irradiation with β-rays from an electron-beam accelerator thereby to produce a wood-plastics composite structure free of cracks.

3,704,162

SUBBING COMPOSITION FOR POLYESTER FILMS

Koji Oshibuchi, Motoo Kogure, Masaru Kanbe, and Nobuo Harajima, Tokyo, Japan, assignors to Keuffel & Esser Company, Morristown, N.J.

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,439

Claims priority, application Japan, Nov. 20, 1969, 44/92,478

Int. Cl. G03c *1/80*

U.S. Cl. 117—76 F 9 Claims

Polyester films are rendered acceptable of adherent layers by a coating of a subbing composition which includes a mixture of gelatin and a phenol derivatives with a polymer comprising units of a halogen-containing acrylic acid derivative. The subbing presents a hydrophilic surface which is receptive of polymeric coating compositions or aqueous coatings of silver halide or diazotype photographic compositions.

3,704,163

METHOD OF MANUFACTURING MINIATURIZED ELECTRIC CIRCUITS

Pol Jean Limbough, Lillois-Witterzeel, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

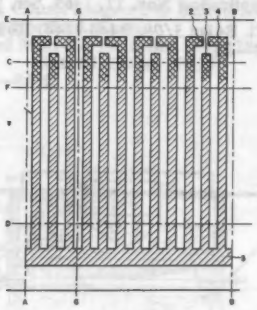
Original application June 20, 1967, Ser. No. 647,466. Divided and this application June 11, 1970, Ser. No. 57,876

Claims priority, application Netherlands, June 23, 1966, 6608701

Int. Cl. B44d *1/18*

U.S. Cl. 117—212 2 Claims

A method of mass producing miniaturized electrical circuits provided with supply conductors. A plate carrier is coated with a layer of electrically resistant material and then a first conductive layer is deposited on the coated plate carrier to form an electrode pattern; a second conductive layer is deposited over the carrier and electrode pattern and etched to form a supply conductor pattern, subsequently the conductor pattern is reinforced electrolytically and then the carrier is separated from these portions of second layer thus forming the supply conductors.



3,704,164

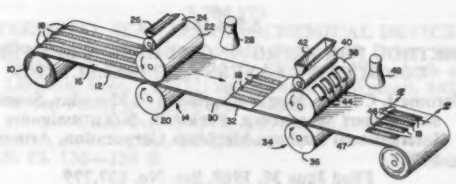
PRINTED CIRCUITRY

Lawrence R. Travis, Brockton, Mass., assignor to Electro Connective Systems, Inc., Brockton, Mass.

Filed June 19, 1968, Ser. No. 738,144

Int. Cl. B44d *1/18, 1/02*

U.S. Cl. 117—212 4 Claims



Apparatus for and a method of producing indefinite lengths of flexible flat circuitry, such as flexible flat cable having one or more electrical conductors forming circuit paths between two insulatory layers with openings in predetermined locations of one insulatory layer for attachment of terminals, etc. A sheet of insulatory material having flat electrical conductors on one of its surfaces is passed through one coating station at which a layer of insulatory material is applied to selected lengths of the circuitry. The sheet is also passed through another coating station at which insulatory material is applied to other lengths of the circuitry at which insulation is desired, leaving uncoated selected locations of the conductor to provide openings for attachment of connectors and other terminating and interconnecting devices.

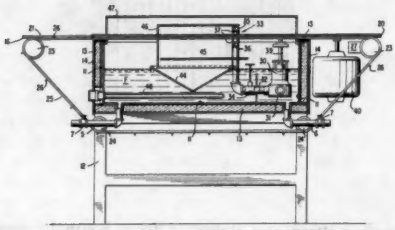
3,704,165

SOLDER LEVELING METHOD

John H. McLain, Huntsville, and Bobby J. Porter, Madison, Ala., assignors to Brown Engineering Company, Inc., Huntsville, Ala.

Original application July 6, 1967, Ser. No. 651,417, now Patent No. 3,491,779, dated Jan. 27, 1970. Divided and this application Nov. 12, 1969, Ser. No. 871,273

Int. Cl. B41m *3/08*; B44d *1/44*; H05k *3/22*
U.S. Cl. 117—212 9 Claims



This invention, relating to a method for establishing a level coating of solder of uniform thickness on metallic surfaces such as the circuitry of printed circuit boards, utilizes a tank containing a volume of fluid maintained at a temperature substantially above that of the melting point of the solder with a conveyor carrying the metallic surfaces, such as printed circuit boards, across the top of the tank and a pump submerged in the hot fluid directing a converging spray of hot fluid at an acute angle onto both sides of the metallic surfaces opposite their direction of motion as they pass across the top of the tank. Oil or a molten salt is utilized as the fluid.

3,704,166

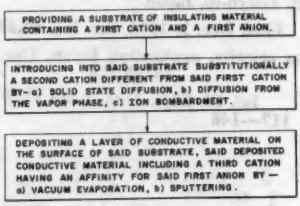
METHOD FOR IMPROVING ADHESION BETWEEN CONDUCTIVE LAYERS AND DIELECTRICS

Jerome J. Cuomo, New York, Ashok F. Mayadas, Somers, and Robert Rosenberg, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,779

Int. Cl. B44d *1/18*
U.S. Cl. 117—217 11 Claims

A method for improving adhesion between a conductive layer and a substrate of insulating material is taught which includes the steps of providing a substrate of insulating material such as silicon dioxide which contains a first cation and a first anion. A second cation such as aluminum is introduced into the substrate substitutionally by diffusion or ion bombardment. Finally, a layer of conductive material is deposited on the surface of the substrate by vacuum evaporation or sputtering. The conductive material includes a third cation such as tungsten which has an affinity for the first anion. The introduction of the second cation is carried out in only the surface layers of the substrate such that dielectric characteristics of the substrate are substantially unaffected. The invention basically teaches providing sites, in an insulating substrate, containing unbound atoms which are capable of chemically bonding with the deposited conductive material thereby obtaining improved adhesion at low temperature (e.g. at temperatures of


PROVIDING A SUBSTRATE OF INSULATING MATERIAL CONTAINING A FIRST CATION AND A FIRST ANION.
INTRODUCING INTO SAID SUBSTRATE SUBSTITUTIONALLY A SECOND CATION DIFFERENT FROM SAID FIRST CATION BY- a) SOLID STATE DIFFUSION, b) DIFFUSION FROM THE VAPOR PHASE, c) ION BOMBARDMENT.
DEPOSITING A LAYER OF CONDUCTIVE MATERIAL ON THE SURFACE OF SAID SUBSTRATE, SAID DEPOSITED CONDUCTIVE MATERIAL INCLUDING A THIRD CATION HAVING AN AFFINITY FOR SAID FIRST ANION BY— a) VACUUM EVAPORATION, b) SPUTTERING.

500° C. and below for W or Mo, whereas without the sites provided, poor adhesion would take place below 500° C.).

3,704,167

PROCESS FOR MANUFACTURING PHOTOGRAPHIC FILM HAVING A MAGNETIC RECORDING STRIPE

Nobuo Yamamoto and Hideo Kawaguchi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed June 11, 1971, Ser. No. 152,423

Claims priority, application Japan, June 11, 1970, 45/50,563

Int. Cl. H01f *10/00*; G03c *1/84*
U.S. Cl. 117—239 18 Claims

An improvement in a process for manufacturing a photographic film with a magnetic recording stripe wherein a dispersion of magnetic material is coated on an antihalation layer of the light-sensitive photographic film using as the support polyethylene terephthalate. The improvement comprises either adding a compound having at least two aziridine rings into the dispersion and then coating the dispersion on the antihalation layer, or by first treating the antihalation layer with a solution containing a compound having at least two aziridine rings and then coating the dispersion on the antihalation layer thus obtained.

3,704,168

PROCESS FOR THE CRYSTALLIZATION OF GLUCOSE, FRUCTOSE, OR MIXTURE OF GLUCOSE AND FRUCTOSE

Kazuo Hara and Mistunobu Samoto, Yokohama, Masanobu Sawai, Yamato, and Shiro Nakamura, Tokyo, Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, and Japan Chemurgy Co., Ltd., Yokohama, Japan

No Drawing. Filed June 2, 1970, Ser. No. 48,542

Claims priority, application Japan, June 27, 1969, 44/50,388

Int. Cl. C13f *1/02, 1/06, 1/12*
U.S. Cl. 127—58 11 Claims

A process for the crystallization of glucose, fructose, or a mixture of the two, which is characterized in that the crystallization is performed in the presence of a combination medium of a liquid polyhydric alcohol and liquid monohydric alcohol as the crystallization medium.

3,704,169

DRYING OF SUGAR SOLUTIONS

Edward T. Woodruff, Woodbine, Md., and Viggo S. Andersen, Hackettstown, N.J., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 3, 1971, Ser. No. 139,852
Int. Cl. C13f *1/02*
U.S. Cl. 127—62 8 Claims

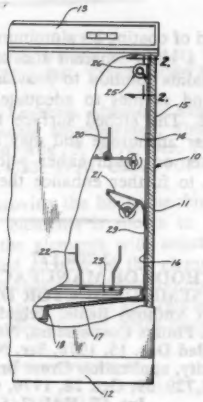
In a process for continuously preparing dried, solid, sucrose-containing products from a sucrose-containing solution by drying droplets of the said solution in a current of heated air and in the presence of separately introduced recycled dried product solids, the improvement comprising continuously controlling the average particle size of the recycled product below about 200 microns.

3,704,170

DISHWASHER CONDENSER SYSTEM

William G. Landwier, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Continuation of abandoned application Ser. No. 739,558, June 24, 1968. This application Nov. 16, 1970, Ser. No. 90,062
Int. Cl. B08b *3/02*
U.S. Cl. 134—25 A 2 Claims



Dishwashing apparatus is provided with a cold water supply conduit so that an inside wall can be kept wet with a cold water film during the drying portion of the cycle in order to condense the water evaporated from the dishes.

3,704,171

CATALYTIC MEMBRANE AIR ELECTRODES FOR FUEL CELLS AND FUEL CELLS CONTAINING SAME

Henry Patrick Landi, Yorktown Heights, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 18, 1970, Ser. No. 38,573
Int. Cl. H01m *29/02*
U.S. Cl. 136—86 A 5 Claims

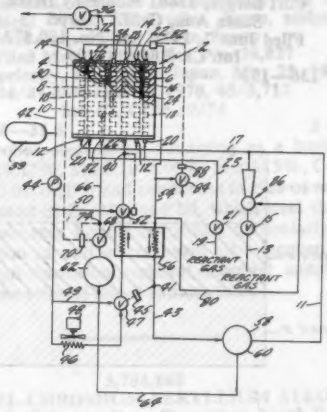
Diffusion electrodes for fuel cells, and particularly suitable for metal-air fuel cells comprise two layers of porous sheet material laminated with a conductor screen. Both porous layers comprise polytetrafluoroethylene (PTFE) binder with partial filler of a low-melting resin incorporated to effect lamination at temperature below the sintering temperature of PTFE. One layer is a conductive porous electrode layer with fillers of carbon and silver. The other is a porous backing layer with filler of polyolefin fibers. The electrodes are especially suited as air electrodes for cells requiring low cost materials and long service life.

3,704,172

DUAL MODE FUEL CELL SYSTEM

James K. Stedman, Glastonbury, and Ronald Cohen, Newington, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 29, 1971, Ser. No. 128,774
Int. Cl. H01m *27/12*
U.S. Cl. 136—86 C 6 Claims



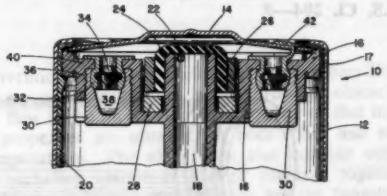
A dual mode fuel cell system is provided by the combination of a fuel cell power section with separate waste heat and electrolyte diluent removal subsystems for open cycle operation and for closed cycle operation.

3,704,173

TERMINAL SEAL ELECTROCHEMICAL DEVICE

Donald H. McClelland, 6160 Rosewood Drive; and Herbert G. Pankow, 6017 S. Elizabeth Way, both of Littleton, Colo. 80121; and Edward O. Wolcott, 8425 W. 3rd Place, Denver, Colo. 80226

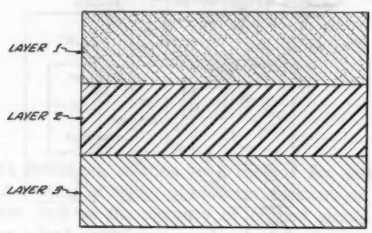
Filed Oct. 7, 1970, Ser. No. 90,178
Int. Cl. H01m *1/02*
U.S. Cl. 136—135 R 18 Claims



An electrochemical device having a resilient, electrolyte resistant inner lining and top (e.g. of plastic) and connections between the electrodes of the device through the inner top to the device terminals which are sealed by a compression fit between the terminal connecting post and resilient inner top. A hole or port in the resilient

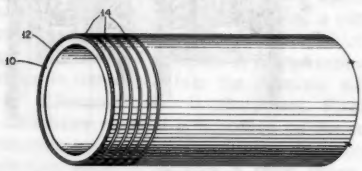
member at the point of connection carries the terminal connecting post which consists of a hollowed-out deformable electrical conductor (e.g. of lead). This deformable post is made to expand against the plastic lining to form a liquid seal compression fit. The expansion may be provided, inter alia, by an externally expanded rivet or by the action of a self tapping screw. This seal has particular utility in sealed or resealably safety valved battery and other electrolytic cells.

3,704,174
SOLID ELECTROLYTE DEVICE
Carl Berger, 13401 Kootenay Drive, Santa Ana, Calif. 92705
Filed June 7, 1971, Ser. No. 150,573
Int. Cl. H01m *43/06*
U.S. Cl. 136—153 **10 Claims**



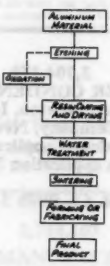
Solid electrolytes comprising compounds having high electrolytic conductivity, wherein the compounds are complexes of salts combined with macrocyclic polyethers. Such electrolytes can be employed in electrolytic devices such as batteries or coulometric devices such as timers. Moreover they may be employed as separators in electrolytic systems, aqueous and nonaqueous; applications in electrodialysis and reverse osmosis are also feasible. The solid electrolytes of this invention represent a substantial advance in applicability and cost compared to presently available solid electrolytes.

3,704,175
ELECTROFORMING JOINTLESS METAL BELT
John J. MacKinney, Narberth, Pa., assignor to The Budd Company, Philadelphia, Pa.
Filed Feb. 1, 1971, Ser. No. 111,215
Int. Cl. C23b *7/02, 5/56*
U.S. Cl. 204—9 **1 Claim**



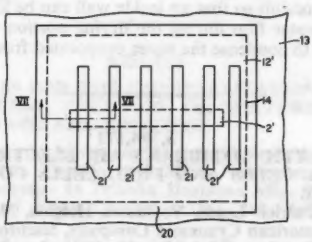
A method of forming a thin metallic endless belt includes the steps of electrodepositing metal on a mandrel, cutting the electrodeposited material into segments and removing the segments from the mandrel.

3,704,176
METHOD OF RESIN COATING A METAL AND RESIN-COATED METAL PRODUCT THEREOF
Toshisaburo Oga, Kobe, and Ken Okazaki, Amagasaki, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Original application Oct. 4, 1966, Ser. No. 584,223, now Patent No. 3,563,785, dated Feb. 16, 1971. Divided and this application Feb. 24, 1970, Ser. No. 13,473
Claims priority, application Japan, Oct. 9, 1965, 40/61,681; Nov. 27, 1965, 40/72,577, 40/72,578; Sept. 17, 1966, 41/61,596; Sept. 22, 1966, 41/62,764
Int. Cl. C23f *7/06*
U.S. Cl. 148—6.27 **9 Claims**



The method of coating an aluminum or aluminum alloy surface with a resin wherein the surface is anodically etched in a halide solution to provide minute surface irregularities and cavities to adequately anchor the resin to be applied. The etched surface may be oxidized to provide greater anchorage and may also be heat treated with hot water or steam either prior or subsequent to resin coating to further enhance the resin bondage and service life.

3,704,177
METHODS OF MANUFACTURING A SEMICONDUCTOR DEVICE
Julian Robert Anthony Beale, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 15, 1970, Ser. No. 98,320
Claims priority, application Great Britain, Dec. 18, 1969, 61,729/69; Oct. 28, 1970, 61,729/70
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **11 Claims**



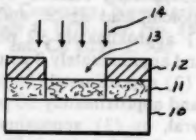
A method for making a high-frequency bipolar transistor is described. The method employs selective ion implantation to form highly conducting mutually spaced stripe portions in the base region of the transistor. The stripe portions may be formed directly below and spaced from the emitter region. A heavy metal mask defined by electron-resist methods may be provided at least in the emitter window to selectively mask against the implantation.

3,704,178

PROCESS FOR FORMING A P-N JUNCTION IN A SEMICONDUCTOR MATERIAL

Bryan H. Hill, Dayton, Ohio
(2525 Stewart Road, Xenia, Ohio 45385)

Filed Nov. 5, 1969, Ser. No. 874,196
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 6 Claims



A solid body of a first conductivity type has a passivating oxide layer formed on one of its surfaces; a mask having an opening therein is provided over the layer; the opening is exposed to ion radiation so as to implant ions in the oxide layer; and the solid body is heated, thereby driving ion dopants from the oxide layer into the body and providing a region therein having a conductivity opposite the first conductivity type.

3,704,179

PROCESS FOR IMPROVING THERMO RESPONSE CHARACTERISTICS OF THERMOSTAT METAL ELEMENTS

Henry Ty and Joseph Luerken, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,635
Int. Cl. C23c *1/10*; C23f *7/04*
U.S. Cl. 148—6.17 4 Claims

A process for improving the heat-absorbing properties of thermostat metal elements is shown to include controlled tumbling of the elements with selected abrasives followed by controlled etching of the elements with selected etchants for increasing and blackening the surface areas of the elements in a uniform and reproducible manner without deleteriously altering other properties of the elements.

3,704,180

METHOD FOR PRODUCING TOUGH, HIGH STRENGTH STEEL ARTICLE

William E. Heitmann, Dolton, Ill., and Frank Garofalo, Munster, Ind., assignors to Inland Steel Company, Chicago, Ill.

No Drawing. Original application Aug. 28, 1968, Ser. No. 755,769, now Patent No. 3,562,028, dated Feb. 9, 1971. Divided and this application June 2, 1970, Ser. No. 54,088
Int. Cl. C21d *7/14*
U.S. Cl. 148—12 5 Claims

Steel article, such as plate, having a relatively high yield strength, e.g. 70,000 p.s.i., together with a relatively high impact resistance, e.g. 15 foot-pound Charpy V-notch impact transition temperature in the range −50° to 100° F. or lower. Microstructure is ferrite plus pearlite. Ferritic grain size is 9.5 ASTM or finer. Composition, in wt. percent:

Carbon	0.02–0.26
Manganese	1.25–1.75
Silicon	0.75–1.5
Nitrogen	0.003–0.015
Aluminum	0.01–0.08
Vanadium	0–0.07
Columbium	0–0.03
Tungsten	0–0.1

Article is hot rolled with at least 25% deformation at finishing temperature above A_1 to give microstructure containing fine grained austenite (9.5 ASTM or finer). Cooling is rapid but controlled to avoid low temperature transformation products in microstructure. Normalizing optional.

3,704,181

COLD ROLLED STEEL SHEET HAVING STABILIZED THIN OXIDE FILM AND HAVING EXCELLENT RESISTANCE AGAINST CORROSION PARTICULARLY INITIAL RUST FORMATION AS WELL AS AGAINST CORROSION AFTER LACQUERING

Toshiro Nishihara, Hidejiro Asano, Shigeyoshi Maeda, and Yashichi Oyagi, Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 19, 1970, Ser. No. 38,827
Claims priority, application Japan, May 28, 1969, 44/41,464; Jan. 23, 1970, 45/5,717
Int. Cl. C22c *39/54*
U.S. Cl. 148—31.5 3 Claims

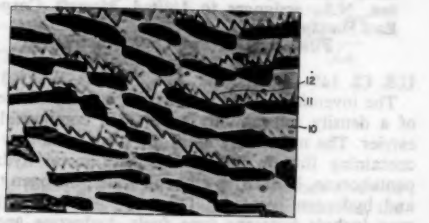
A cold rolled steel sheet containing as a basic components C≤0.12%, Mn 0.10–1.00%, Si≤0.15%, Cu 0.01–0.20%, Sb 0.01–0.20% and containing in case of necessity a small amount of Zr, Mo, and Ni, which steel sheet has excellent resistance against corrosion, particularly initial rust formation as well as corrosion after lacquering and provides high corrosion resistant material suitable for cans when the ratio of S to P is more than 1.

3,704,182

NICKEL-CHROMIUM-BERYLLIUM ALLOY

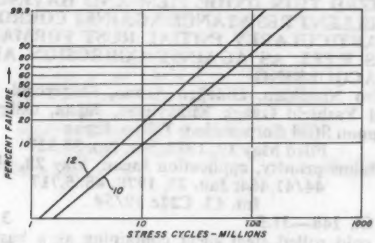
Leonard B. Griffiths and Yuan-Shou Shen, North Reading, Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of application Ser. No. 793,814, Jan. 24, 1969. This application June 11, 1969, Ser. No. 832,335
Int. Cl. C22c *19/00*
U.S. Cl. 148—32 8 Claims



This invention relates to a nickel-chromium-beryllium alloy having a microstructure which provides obstacles to plastic flow in the nickel rich matrix phase so that high strength properties are obtained at both room and elevated temperatures. The alloy may also contain other additives including aluminum and/or titanium together with hardeners including molybdenum and/or tungsten, with or without carbon. A method of processing the alloy comprises: melting the alloying ingredients in a crucible while avoiding the presence of oxygen; raising the temperature to 1450 to 1550° C.; casting the alloy in a mold. The alloy may be remelted and cast in an apparatus to effect abstraction of heat from the casting from one direction only to obtain a directionally orientated microstructure.

3,704,183
METHOD FOR PRODUCING A LOW-COST HYPEREUTECTOID BEARING STEEL
Charles P. Weigel, Canton, Ohio, assignor to The Timken Company, Canton, Ohio
Filed May 26, 1971, Ser. No. 146,911
Int. Cl. B22d 25/00; C21d 7/14
U.S. Cl. 148—126 2 Claims



Method for producing a low-cost hypereutectoid bearing steel having characteristics equal to or superior to higher priced steels of this type and containing as essential alloying additions .80–1.10% carbon, .50–1.00% manganese, .20–.60% chromium and .05–.25% molybdenum. A steel of this type, usually in the form of wire, rod, bar, forgings, rings or tubing, is annealed at a maximum temperature of 1400° F. for thirteen hours to produce an annealed microstructure comprising spheroidized carbides in a matrix of ferrite. After forming into bearing races or balls, the formed product is quenched from 1550° F. and thereafter tempered to produce a steel having a Rockwell C hardness of about 60 or greater and excellent fatigue strength.

3,704,184
ISOPYCNIC SLURRY FORMULATIONS
Donald K. Kuehl, Manchester, Conn., Arthur W. Blackman, Cambridge, Mass., and Irvin Glassman, Princeton, N.J., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Oct. 22, 1965, Ser. No. 501,721
Int. Cl. C06b 15/00, 19/02
U.S. Cl. 149—1 3 Claims

The invention relates to slurry of a finely divided metal of a density substantially equal to a combustible liquid carrier. The metal may be in the form of hollow spheres containing lithium and low density metal hydrides or pentaborane, hydrazine, ethanol, water, nitrogen tetroxide and hydrogen peroxide. The combustible liquid carrier may include kerosene type fuels, hydrazine and pentaborane or liquid oxidizer carriers such as hydrogen peroxide, liquid oxygen, chlorine trifluoride and nitrogen tetroxide. These slurries are useful as liquid propellants or fuels.

3,704,185
PROGRESSIVE BURNING SMOKELESS POWDER COATED WITH AN ORGANIC ESTER
William W. Chooner, Wenonah, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Mar. 1, 1965, Ser. No. 437,632
Int. Cl. C06b 19/02
U.S. Cl. 149—11 7 Claims

Progressive burning smokeless powder coated with water insoluble organic ester melting below about 35° C. and boiling above about 200° C. in which nitrocellulose has a specific solubility.

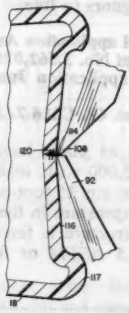
3,704,186
PRIMARY EXPLOSIVE COMPOSITIONS FOR EXPLOSIVE BONDING OR FORMING
Terri Giversen Steele, Hamilton Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.
No Drawing. Filed Aug. 23, 1971, Ser. No. 174,194
Int. Cl. C06c 1/02
U.S. Cl. 149—35 10 Claims

A screenable primary explosive composition for explosive bonding or forming consists of 60–70 percent by weight of colloidal lead azide, and the balance a vehicle having (1) approximately 92 percent by weight of beta-terpineol and approximately 8 percent by weight of ethyl cellulose, or (2) approximately 90 percent by weight of beta-terpineol and approximately 10 percent by weight of polyvinyl butyral, or (3) approximately 92 percent by weight of pine oil and approximately 8 percent by weight of ethyl cellulose. Where difficulty is encountered in mixing the lead azide in the higher weight percentage with the vehicle, particularly where the vehicle consists of beta-terpineol and ethyl cellulose, the lead azide may be moistened with a small amount of nitrocellulose (e.g. 0.05 ml. nitrocellulose/gm. lead azide and vehicle) to facilitate mixing with the vehicle.

3,704,187
PYROTECHNIC DISSEMINATING COMPOSITION
Alan C. Kott, Mount Pleasant, and Erwin M. Jankowiak and George A. Lane, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 1, 1967, Ser. No. 667,043
Int. Cl. C06b 1/04
U.S. Cl. 149—60 6 Claims

A pyrotechnic disseminating formulation comprising an inorganic oxidizer which readily is combustible at atmospheric pressure, an epoxy resin binder as fuel and an effective quantity of an agent to be disseminated.

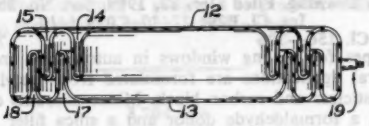
3,704,188
TRIMMING FLASH WITH ULTRASONIC TOOL
Richard MacDuff, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Dec. 30, 1970, Ser. No. 102,693
Int. Cl. B29c 27/08; B32b 31/18
U.S. Cl. 156—73 3 Claims



The invention is concerned with trimming the flash from a pinch area in a recessed portion in the bottom of a thermoplastic container which is connected to a chain of containers each of which is attached to each other by

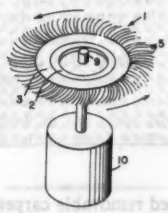
the flash. The trimming is effected by moving and vibrating the cutting edge of an ultrasonic horn into contact with the pinch and cutting through the pinch while the container is loosely supported.

3,704,189
METHOD OF MAKING A JACK
Richard S. Varga, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed July 6, 1971, Ser. No. 159,683
Int. Cl. B29c *27/28*
U.S. Cl. 156—69 5 Claims



An improved method for making an inflatable pneumatic bag jack in the form of a cylindrical bag of impervious flexible elastomeric material of a diameter several times its axial collapsed length wherein annular corrugations are in the flat end faces immediately inside the periphery.

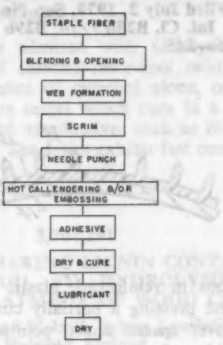
3,704,190
METHOD OF MAKING A HIGH STRENGTH FITTING FOR A FLEXIBLE WALL CONTAINER
Robert W. Bucher, Glendale, Ariz., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed July 19, 1971, Ser. No. 163,854
Int. Cl. B32b *31/18*
U.S. Cl. 156—74 6 Claims



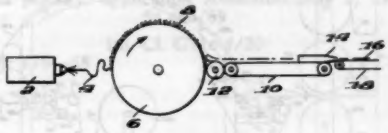
A method of making a high strength fitting for a flexible wall container such as a fuel tank or the like comprising the steps of inserting flexible strands or cords through holes in a rigid ring member, rotating the ring member to orient the strands in a radially outwardly extending position, positioning binder layers adjacent the strands, applying pressure to embed the strands in the binder and trimming the radially outer edge of the assembled part.

3,704,191
NON-WOVEN PROCESS
Francis M. Buresh, N. Jay Road, Au Sable Forks, N.Y. 12912; Stanley M. Nisenson, 8855 Bay Parkway, Brooklyn, N.Y. 11214; Walter P. Lipscomb, 12300 Winfree St., Chester, Va. 23831; and Anthony M. Saich, 806 Forest View Drive, Colonial Heights, Va. 23834
Filed Dec. 1, 1969, Ser. No. 881,038
Int. Cl. B32b *31/12*
U.S. Cl. 156—148 9 Claims

A process for making non-woven nylon carpet backing for either tufted or needle-punched carpets, comprising the steps of forming nylon web and bonding the same together with an open filament yarn base, by a combination of mechanical entanglement, selective heat treatment, and a binder, as described hereinafter.



3,704,192
PROCESS OF MAKING TOBACCO SMOKE FILTERS FROM EXTRUDED POLYMER AND BINDER
John William Soehngen and William Sherwood Wagner, Berkeley Heights, Saunders Eliot Jamison, Summit, and Dale Kelley Canfield, Chatham, N.J., assignors to Celanese Corporation
Original application Sept. 21, 1966, Ser. No. 580,993, now Patent No. 3,444,863, dated May 20, 1969. Divided and this application Feb. 6, 1969, Ser. No. 835,827
Int. Cl. D04h *3/16*
U.S. Cl. 156—167 6 Claims



Cigarette filters are prepared from a random array of continuous spray-spun synthetic filamentary material, the filaments of said filamentary material varying in diameter with the periodicity characteristics of the filament being such that the change in diameter occurs over a relatively long distance along the filament length.

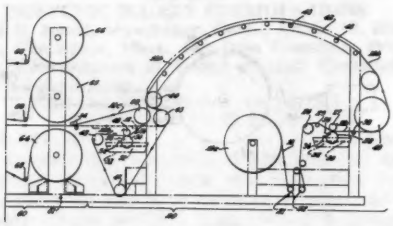
3,704,193
METHOD OF STRAIN-HARDENING FOAMED METAL
Alex R. Valdo and Jerry M. Janes, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Oct. 5, 1970, Ser. No. 78,214
Int. Cl. C22f *1/04;* B32b *3/26, 15/00*
U.S. Cl. 156—196 20 Claims

Foamed metals and foam metal laminates having greater strength are produced by strain-hardening the foamed metal to improve its strength and to provide a smooth surface for producing laminates having greater resistance to delamination.

3,704,194
PERFORATED REINFORCED PLASTIC MEMBER AND METHOD FOR MAKING
Stanley C. Harrier, Cincinnati, Ohio, assignor to General Electric Company
Filed July 2, 1970, Ser. No. 51,991
Int. Cl. B28b 7/30; B29b 19/00
U.S. Cl. 156—245 4 Claims

Perforations in reinforced, plastic members are provided by first pressing a partially cured sheet, or series of sheets, over spaced apart, pointed, studs projecting from a mold surface portion. The sheet is then cured while pressed on the mold surface. In one form of the method, the studs are at least partially elastic and the sheet, after curing, is removed from the studs. In another form, the studs are hollow and, when the projecting tips are cut away, perforations remain.

3,704,195
APPARATUS FOR THE CONTINUOUS IN-LINE PRODUCTION OF MULTI-LAYERED PRODUCT UNITS
Earl W. Zitzler, Park Ridge, and John Ideboen, Mount Prospect, Ill., assignors to Colonial Carbon Company, Des Plaines, Ill.
Filed Aug. 11, 1969, Ser. No. 849,063
Int. Cl. B32b 31/12
U.S. Cl. 156—250 14 Claims

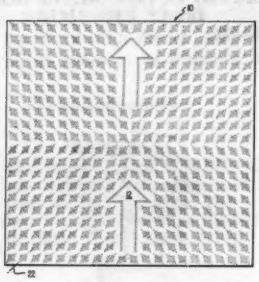


Packages of predetermined numbers of reproduction product units of consistently high quality are produced from continuous web stock material in a continuous in-line process and apparatus. In the apparatus a continuous web of coating stock proceeds through a tensioner system, thence through a first coating means, thence through a conditioning means including a tempering roller, conditioning or drying arch and chilling drive rollers, thence through a second coating means, thence between vertically aligned continuous component strips, thence through a web guide section which controls the web tension and vertical alignment, thence about a series of rollers including an assembly roller and rotating cutting head to a delivery or packaging section where the cut product units are counted and packaged. The method includes the steps of relieving the residual stresses in a continuous strip of stock material, pre-heating the strip, coating the strip, tempering the strip, conditioning the strip, chilling the strip, optionally coating the strip a second time on the same side as the first coating, feeding the coated strip between continuous strips of component elements of the final product unit, gluing, imprinting and perforating the various components of the final product unit and assembling the components to provide a continuous assembled strip, cutting the strip into predetermined lengths and packaging the cut product units in predetermined numbers.

3,704,196
SELF-CURING SEALANT COMPOSITIONS
John E. Callan, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 22, 1969, Ser. No. 887,402
Int. Cl. B29c 27/30; C09k 3/10
U.S. Cl. 156—306 7 Claims

Tapes for sealing windows in automotive and architectural applications are formulated from butyl rubber, a plasticizer and carbon black. Minor amounts of resorcinol, a formaldehyde donor and a silica filler are also included in the formulation to provide a self-curing tape which slowly vulcanizes in service and which is characterized by excellent bond strength and low heat flow.

3,704,197
REMOVABLE FLOOR COVERING
Jurgen F. Bahlo, Cherry Hill, N.J., assignor to General Felt Industries, Inc., Saddle Brook, N.J.
Filed Apr. 5, 1971, Ser. No. 131,019
Int. Cl. B32b 3/06, 7/14
U.S. Cl. 161—67 14 Claims

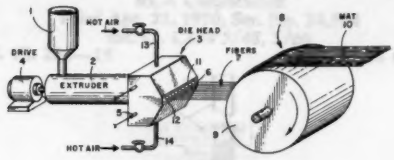


An adhesive backed removable carpet tile comprising a foam backing and a carpet layer is disclosed which may be applied to a subfloor and subsequently removed therefrom without delaminating the foam backing. The adhesive provides a release strength lower than the delamination strength of the foam backing. To provide the proper release strength, the adhesive is applied to the foam backing by a figurated roller to cover between 10 and 50 percent of the foam backing.

3,704,198
NONWOVEN POLYPROPYLENE MATS OF INCREASED STRIP TENSILE STRENGTH
James S. Prentice, Baytown, Tex., assignor to Esso Research and Engineering Company
Filed Oct. 9, 1969, Ser. No. 865,089
Int. Cl. D04h 3/14
U.S. Cl. 161—148 7 Claims

The strip tensile strength of nonwoven mats of polypropylene fibers having a diameter from about 1 to about 10 microns is increased, for example, to strengths greater than 4000 m., by fuse-bonding, as by calendering or

point-bonding, at least a portion of the fibers of the mat at temperatures within the range from about 250° F. to



about 325° F., preferably, from about 280° F. to about 315° F., while the mat is subjected to pressure sufficient to prevent shrinkage of the fibers in the mat.

3,704,199

PRODUCTION OF COATED FIBERS AND COATING COMPOSITION

Clayton A. Smucker, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

No Drawing. Continuation of application Ser. No. 329,250, Dec. 9, 1963, which is a continuation-in-part of application Ser. No. 23,389, Nov. 8, 1963, and a continuation-in-part of application Ser. No. 853,438, Nov. 17, 1959, all now abandoned. This application Jan. 4, 1971, Ser. No. 103,926

Int. Cl. D04h *3/12*

U.S. Cl. 161—157 **3 Claims**

Glass fiber thermal or acoustical insulating material and method for production thereof. Glass fibers are deposited with a binder on a conveyor and conveyed through an oven where the binder is cured. The mass of fibers and binder is compressed, if required, to provide a desired apparent density. The binder is a phenol formaldehyde condensate produced using barium hydroxide as a condensing agent; after condensation, the barium hydroxide is converted to barium sulfate particles in the size range of from 1 millimicron to 1 micron. The barium sulfate particles remain suspended in the resin, become a part of the binder composition, and are distributed throughout the binder in the final product. Their presence facilitates binder flow in the glass fiber process and improves the strength of the final product.

3,704,200

CONDENSATION RESINS FROM ALDEHYDES, POLYNUCLEAR CATECHOL AND RESORCINOL

Frederick L. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

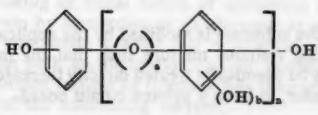
Continuation-in-part of application Ser. No. 739,754, June 25, 1968. This application May 19, 1970, Ser. No. 36,692

Int. Cl. C08g *5/10*

U.S. Cl. 161—262 **12 Claims**

Resins which are the reaction product of an aldehyde and

(A) at least one polyhydric, polynuclear compound of the formula:



wherein a is 0 or 1, b is 0 or 1, $a+b$ equals 1, and n is an integer from 1 to 4, inclusive; and

(B) 10 to 80 weight percent, based on the combined weight of A and B, of catechol and resorcinol wherein the weight ratio of catechol to resorcinol is 25:100 to 85:100, are disclosed.

These resins are admixed with aldehyde-containing hardeners, resins of catechol-resorcinol mixtures below the stated ratio, resins of catechol alone, or resins of resorcinol to prepare resins which cure in a short time and which are useful as adhesives such as in the manufacture of plywood. The resins exhibit fast cure and good shelf-life.

3,704,201

METHOD OF MAKING LIGNIN CONTAINING GROUNDWOOD BY HYDROLYSIS AND ALKALI TREATMENT OF WOOD CHIPS

Olavi Erland Helasti, Pyhan Laurintie, Helsinki, Finland

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,718

Int. Cl. D21c *3/26*

U.S. Cl. 162—19 **2 Claims**

A method for making groundwood from wood chips. The wood chips are subjected to hydrolysis which removes most of hemicellulose from the wood but leaves intact most of the lignin. The resulting product is neutralized and treated with alkali and then refined and washed.

3,704,202

FUEL ELEMENT FOR HIGH TEMPERATURE NUCLEAR REACTOR

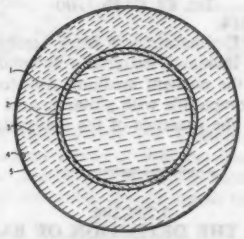
Keith Desmond Reeve, Caringbah, New South Wales, and Eric John Ramm, Lilli Pilli, New South Wales, Australia, assignors to Australian Atomic Energy Commission, Coogee, New South Wales, Australia

Filed May 5, 1970, Ser. No. 34,803

Claims priority, application Australia, May 5, 1969, 54,403/69

Int. Cl. G21c *3/20*

U.S. Cl. 176—68 **1 Claim**



A substantially spherical fuel element for nuclear reactors comprises a core containing a finely divided solid solution of fuel dispersed in a fine grained beryllia matrix, a dense outer shell of fine grained beryllia, a buffer zone of porous beryllia between said core and said shell, a dense outer coating of alumina on said outer shell and a thin layer of crysoberyl as a bond between the alumina coating and said shell.

3,704,203

TRANSMISSIBLE GASTROENTERITIS VACCINES AND METHODS OF PRODUCING THE SAME

Clarence J. Welter, Des Moines, Iowa, assignor to Diamond Laboratories, Inc., Des Moines, Iowa

No Drawing. Application July 14, 1969, Ser. No. 841,607, now Patent No. 3,585,108, which is a division of application Ser. No. 671,526, Aug. 24, 1967, now Patent No. 3,479,430. Divided and this application Nov. 18, 1970. Ser. No. 90,850

Int. Cl. A61k *23/00;* C12k *7/00*

U.S. Cl. 195—1.3 3 Claims

Transmissible gastroenteritis virus is grown and propagated in tissue cultures by inoculating virulent virus particles into a first tissue culture, allowing the virus to grow, introducing the viral particles into other tissue cultures until a continuated virus is obtained. A final virus culture can be harvested and combined with a stabilizer and further incubated to inactivate the virus. Sows and their nursing pigs can be immunized by injecting into the pregnant sow before farrowing the vaccine thus produced.

3,704,204

TEST MEDIUM AND METHOD FOR THE DETECTION OF SALMONELLA

Joseph G. Heck, Lombard, and Warner M. Hill, Downers Grove, Ill., assignors to Armour and Company, Chicago, Ill.

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,002

Int. Cl. C12k *1/10*

U.S. Cl. 195—100 10 Claims

A test medium and method for the rapid detection of salmonellae wherein the medium provides a source of nutrients for Salmonella organisms, a fermentable carbohydrate, a substrate for the production of hydrogen sulfide gas, and selective microorganism inhibitors. Means are provided for the detection of acid production and hydrogen sulfide. A sample incubated in the medium may be declared Salmonella free after approximately 24 hours.

3,704,205

METHOD OF PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Teruo Shiro, Koichi Takinami, Eiichi Akutsu, Hiroe Yoshii, and Yasutsugu Yamada, Chigasaki-shi, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,885

Claims priority, application Japan, Mar. 3, 1969, 44/16,054

Int. Cl. C12b *1/00*

U.S. Cl. 195—114 2 Claims

The yield of L-glutamic acid from aerobic cultures of bacteria can be increased materially by small amounts of antioxidants in the nutrient medium. Anti-foaming agents not otherwise compatible with glutamic acid cultures may be employed in the presence of the antioxidants.

3,704,206

DEVICE FOR THE DETECTION OF BACTERIA IN AQUEOUS FLUIDS

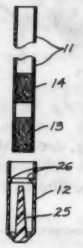
Ronald Freake, Claude Ray Gunter, Billy Harpen Haden, and Nagesh Shamrao Mhatre, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 25, 1971, Ser. No. 118,663

Int. Cl. C12k *1/04*

U.S. Cl. 195—127 3 Claims

A method and device for detecting bacteria in aqueous fluids is disclosed consisting essentially of a two component system, the first component comprising a stable peroxide and the second a peroxide detecting system. In use the fluid being tested is initially contacted with the first component comprising the peroxide whereby certain bacterial components, if present in the fluid, react with and degrade the peroxide. The test fluid is then contacted with the peroxide detecting system for measurement of



peroxide degradation. A detected decrease in peroxide in the test fluid is indicative of the presence of bacteria therein. A preferable embodiment of the present invention comprises a unitized device wherein the two components are contained in individual matrices.

ERRATUM

For Class 204—9 see:
Patent No. 3,704,175

3,704,207

PROCESS FOR FORMING AN ISOLATED CIRCUIT PATTERN ON A CONDUCTIVE SUBSTRATE

Stokes Fenimore Burtis, Swarthmore, Pa., assignor to RCA Corporation

Filed Apr. 21, 1970, Ser. No. 30,553

Int. Cl. C23b *5/48*

U.S. Cl. 204—15 7 Claims

COAT METAL SUBSTRATE WITH THERMO-SETTING RESIN IN UNCURED STATE
HEAT TO DRIVE OFF SOLVENT AND MOISTURE
ABRADE CURED SURFACE
TREAT WITH AN AQUEOUS SOLUTION
TREAT ABRADED SURFACES WITH OXIDIZING CONDITIONER
SENSITIZE CONDITIONED SURFACES
ACTIVATE SENSITIZED SURFACES
CHEMICALLY DEPOSIT LAYER OF CONDUCTIVE MATERIAL
APPLY NEGATIVE REPRESENTATION OF DESIRED CIRCUIT PATTERN
ELECTROPLATE
REMOVE PATTERN AND PORTIONS OF CONDUCTIVE LAYER COVERED THEREBY
ADVANCE TO FINAL CURE

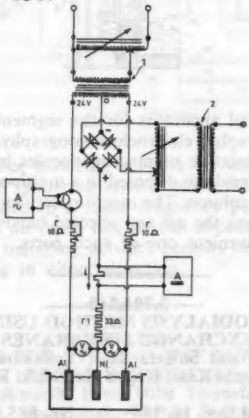
A conductive substrate is modified by the application of a thermo-seting resinous mixture such that the modified substrate may be chemically treated directly thereafter, in a specified manner, to form a printed circuit board.

3,704,208
PROCESS FOR FORMING A CONDUCTIVE COATING ON A SUBSTRATE
Robert Ritter Russo, Indianapolis, Ind., assignor to RCA Corporation
Filed Apr. 21, 1970, Ser. No. 30,554
Int. Cl. C23b *5/48, 5/60*
U.S. Cl. 204—15 16 Claims

COAT WITH THERMOSETTING RESIN IN UNCURED STATE
HEAT TO DRIVE OFF SOLVENT AND MOISTURE
ABRADE COATED SURFACE
ETCH ABRADED SURFACES WITH A NITRIC ACID SOLUTION
TREAT ABRADED SURFACES WITH OXIDIZING CONDITIONER
SENSITIZE CONDITIONED SURFACES
ACTIVATE SENSITIZED SURFACES
CHEMICALLY DEPOSIT CONDUCTIVE LAYER
APPLY NEGATIVE REPRESENTATION OF DESIRED CIRCUIT PATTERN
ELECTROPLATE
REMOVE PATTERN AND PORTIONS OF CONDUCTIVE LAYER COVERED THEREBY
ADVANCE TO FINAL CURE

A substrate is modified by the application of a thermosetting resinous mixture such that the modified substrate may be chemically treated in a specified manner including the use of a nitric acid solution to provide, for example, a printed circuit board.

3,704,209
METHOD FOR ELECTROCHEMICAL COLORING OF ALUMINUM AND ALLOYS
Jos Patrie, Grenoble, France, assignor to Cegedur GP
Filed July 15, 1970, Ser. No. 54,878
Claims priority, application France, July 16, 1969, 6924138
Int. Cl. C23b *9/02*
U.S. Cl. 204—35 N 12 Claims



The coloring of oxide layers of aluminum and alloys of aluminum by immersion as an electrode in an aqueous acid bath containing a metal salt in solution and passing through the bath an alternating current superimposed by a direct current having an intensity less than the effective intensity of the alternating current.

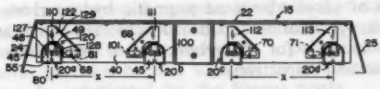
3,704,210
PROCESS FOR COLORING ALUMINUM OBJECTS
Jos Patrie, Grenoble, France, assignor to Cegedur GP
No Drawing. Filed July 15, 1970, Ser. No. 55,295
Claims priority, application France, July 21, 1969, 6924728
Int. Cl. C23f *7/06*
U.S. Cl. 204—35 N 2 Claims

Process for producing colored protective coatings on objects of aluminum or alloys of aluminum in which the surface is provided with a porous layer of alumina and in which metal pigments are deposited into the pores of the layer by alternating current electrolysis with the object mounted as an electrode in an aqueous acid solution of metal salts containing nickel sulphate and nickel chloride as essential salts.

3,704,211
PROCESS FOR ELECTROPLATING MAGNETIC FILMS FOR HIGH DENSITY RECORDING
Sidney L. Phillips, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 19, 1971, Ser. No. 144,961
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 17 Claims

A process for depositing a nickel-cobalt magnetic electroplate upon an electrically conducting substrate by passing a current between an anode and a substrate as the cathode through an electrolyte, where the electrolyte contains at least a soluble nickel salt and a soluble cobalt salt in solution, with the improvement for the purpose of effecting the M_r/H_c ratio characterized by the addition of at least a small but effective amount of rhenium as a soluble rhenium salt to the electrolyte. The rhenium may be specifically added as potassium perrhenate to an electrolyte comprising nickel chloride and cobalt chloride salts in an aqueous solution.

3,704,212
ADJUSTABLE LIGHT FIXTURE FOR U-SHAPED LAMPS
Richard C. Piccola, Hawthorne, N.J., assignor to The Celotex Corporation, Tampa, Fla.
Filed Oct. 22, 1970, Ser. No. 82,897
Int. Cl. H01r *33/08*
U.S. Cl. 240—51.12 5 Claims

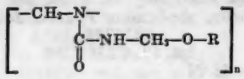


An adjustable light fixture for U-shaped fluorescent lamps accommodates lamps of different base spacing by providing spaced interconnected slots to receive moveable lamp sockets and moveable closure means to hide unused slots.

3,704,213
ACID COPPERING BATH
Roger Fournier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, Hauts-de-Seine, and Automobiles Peugeot, Paris, France
No Drawing. Filed Jan. 20, 1971, Ser. No. 108,141
Claims priority, application France, Jan. 22, 1970, 7002242
Int. Cl. C23b *5/20*; C08g *9/10*
U.S. Cl. 204—52 R 2 Claims

Aqueous bright acid electrolytic coppering bath containing a copper salt, a brightener, a surface tension agent,

characterized in that it further contains a levelling agent having the general formula:



wherein *n* is of the order of 500 to 1,000, resulting from the addition of two formaldehyde molecules on one urea molecule, the resultant molecule being modified by a heavy alcohol or one of its derivatives.

3,704,214

PROCESS FOR PREPARING PERFLUORINATED LINEAR POLYETHERS

Dario Sianesi, Adolfo Pasetti, and Constante Corti, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Application June 30, 1967, Ser. No. 650,257, which is a continuation-in-part of application Ser. No. 446,292, Apr. 7, 1965. Divided and this application May 1, 1970, Ser. No. 43,654

Claims priority, application Italy, Apr. 9, 1964, 7,678/64; Dec. 16, 1966, 31,193/66

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 **12 Claims**

Perfluorinated cyclic ethers and fluorinated linear polyethers are prepared by photochemical reaction in liquid phase of perfluoropropylene with oxygen in presence of ultraviolet radiation.

3,704,215

PROCESS FOR THE PRODUCTION OF BENZOYL CHLORIDE AND BENZOTRICHLORIDE USING LIGHT

Walter Böckmann, Krefeld-Uedingen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 6, 1970, Ser. No. 9,444

Claims priority, application Germany, Feb. 26, 1969, P 19 09 523.9

Int. Cl. B01j *1/10*

U.S. Cl. 204—163 R **1 Claim**

Dibenzyl ether which is a by-product of the alkaline hydrolysis of benzylchloride to benzyl alcohol is subjected to the usual conditions for the chlorination of side chains of alkyl-substituted aromatic hydrocarbons yielding benzoyl chloride and benzotrichloride which are useful compounds for the production of benzaldehyde and benzoic acid respectively.

3,704,216

METHOD OF DEPOSITING A METAL OXIDE FILM BY ELECTRON BOMBARDMENT

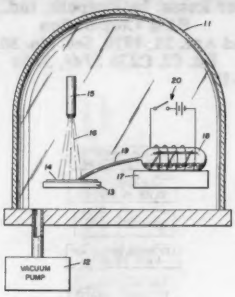
Warren O. Kinstley and David R. Sivertsen, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 11, 1969, Ser. No. 857,048

Int. Cl. C23f *7/02*; B01k *1/00*

U.S. Cl. 204—164 **3 Claims**

A substrate to be coated is supported within an evacuated chamber and subjected to a concentrated flow of an organo-metallic gas. Simultaneously, a high energy electron beam is directed to impinge upon the surface of the substrate to define the area of the substrate to be coated. The energy from the electron beam serves to both ionize the organo-metallic compound and to locally heat an area of the surface of the substrate to be coated thereby pyrolyzing the organo-metallic compound, driving off the organic material and depositing a coating of metal oxide upon the selected area of the substrate. MOS field



effect transistors are formed with insulating oxide films produced by the present process.

3,704,217

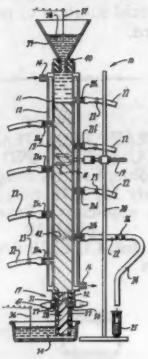
SEGMENTAL MACROMOLECULAR SEPARATION METHOD AND APPARATUS

Samuel T. Nerenberg, 21 Hayward Court, Burlingame, Calif. 94010

Continuation-in-part of application Ser. No. 831,509, June 9, 1969. This application Sept. 8, 1969, Ser. No. 855,966

Int. Cl. B01d *13/02*; B01k *5/00*

U.S. Cl. 204—180 G **13 Claims**



A process and apparatus for the segmental separation by chromatography, electrochromatography, and electrophoresis of a mixture of macromolecules by means of a separation gel medium disposed in a multiported, upstanding, elongated column. The macromolecules are separated into bands across the gel and selected bands are removed through a convenient one of such ports.

3,704,218

ELECTRODIALYSIS METHOD USING ION EXCHANGE MEMBRANES

Masaaki Kato and Shigeta Sato, Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1969, Ser. No. 885,530

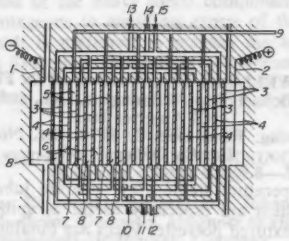
Claims priority, application Japan, Dec. 16, 1968, 43/91,561

Int. Cl. B01d *13/02, 59/42*

U.S. Cl. 204—180 P **16 Claims**

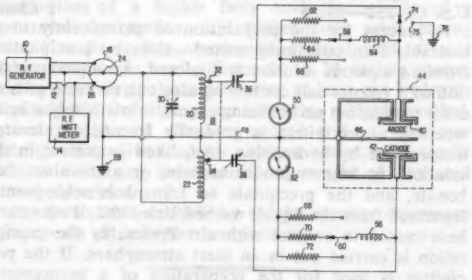
Hydrogen ions and hydroxyl ions are generated economically in an electrodialysis cell comprised of a plurality of anion exchange membranes and cation exchange

membranes alternately juxtaposed between a pair of an anode and a cathode by filling aqueous solution or suspension containing at least one electrolyte which is incapable of passing through the ion exchange membrane and is selected from the group consisting of (1) water soluble polyelectrolytes (polymeric electrolytes) having



negatively charged fixed groups and (2) finely pulverized water-insoluble solid electrolytes having negatively charged fixed groups in the water decomposition compartments and passing a direct current between the electrodes. Polyvalent metal ions in a valence state of at least 2 may be added to said solution or suspension.

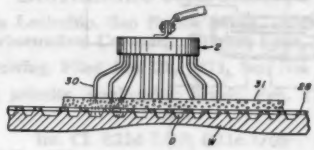
3,704,219
IMPEDANCE MATCHING NETWORK FOR USE WITH SPUTTERING APPARATUS
Robert Bruce McDowell, Metuchen, N.J., assignor to McDowell Electronics, Inc., Metuchen, N.J.
Filed Apr. 7, 1971, Ser. No. 131,903
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **13 Claims**



An impedance matching network for use with a radio frequency bias sputtering system where the system is impedance matched to a radio frequency power generator connected via an input line to the impedance matching network. The matching network permits near 0 to 100% bias sputtering in either direction.

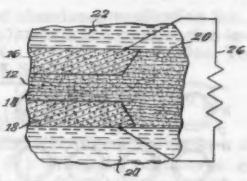
3,704,220
APPARATUS FOR ETCHING THE SURFACE OF A METAL WORKPIECE
Robert H. Ashworth, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation
Filed Apr. 15, 1970, Ser. No. 28,901
Int. Cl. B23p *1/02*; C23b *5/76*
U.S. Cl. 204—224 **7 Claims**

The embossed surface of a metal workpiece is repaired by utilizing an electrode having relatively closely spaced discharge areas adjacent its center and relatively widely spaced discharge areas at its outer portion. A suitable stencil is placed on the surface to be repaired and a pad saturated with electrolytic fluid is placed on the stencil. The electrode and workpiece are connected to opposite poles of a D.C. power source and the free end of the



electrode is pressed into the pad. During the repair embossing operation the electrode is occasionally lifted from the pad and then lowered into the pad in a slightly different position. The apparatus can also be used to emboss the plain surface of a metal workpiece.

3,704,221
MEDIUM FOR IONIC TRANSPORT
Charles Roland McCully, Prospect Heights, Ill.; Roland A. McCully, executor of Charles R. McCully, deceased
Filed Nov. 9, 1967, Ser. No. 681,855
Int. Cl. B01k *3/10*
U.S. Cl. 204—295 **30 Claims**

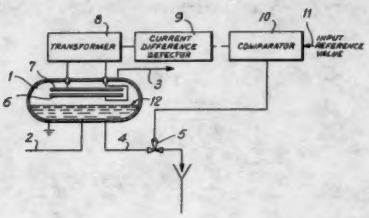


In an electrochemical device, such as a galvanic cell, or an electrolytic cell, there is provided a non-aqueous medium which serves as a barrier to liquid flow while permitting transport of ions. The medium is made of a porous inert retention agent impregnated with a non-aqueous solution of an ionic material containing the ion to be transported. In most cases, the porous inert retention agent is made of mineral fibers, which may be bonded together by a fluorocarbon resin. Less preferably, a porous structure of mineral particles bonded together by a fluorocarbon resin may be substituted for the fibrous matte.

3,704,222
DEVICE FOR AUTOMATIC CONTROL OF THE PROCESS OF CRUDE PETROLEUM DESALTING AND DEHYDRATION IN ELECTRIC DEHYDRATORS
Boris Isaakovich Kusovsky, Nikolai Ivanovich Pavlov, Anatoly Petrovich Matiichenko, Sergi Alexandrovich Zakharov, and Dmitry Anatolievich Birjukov, Ryazan, U.S.S.R., assignors to Ryazansky Filial Spetsialnogo Konstruktorskogo Bjuro Ann, Ryazan, U.S.S.R.
Filed Jan. 22, 1970, Ser. No. 4,957
Int. Cl. B03c *5/02*; C10g *33/02*
U.S. Cl. 204—306 **1 Claim**

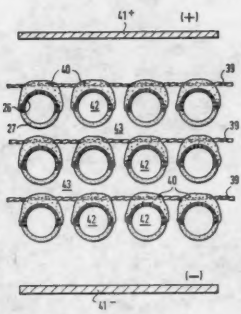
A device for automatic control of crude petroleum desalting and dehydration processes in electric dehydrators by varying the currents in electrode circuits as a result of discharging water and sludge via a regulating valve controlled by an actuating mechanism. A detector determines

current difference in the top and bottom electrode circuits, the detector being connected to a comparator for



comparing the currents in the electrode circuits with a reference input, the comparator being, in turn, coupled to an actuating mechanism of the regulating valve.

3,704,223
DIALYSIS APPARATUS WITH CAPILLARY EXCHANGER
Hans-Joachim Dietzsch, Villars-sur-Ollon, Vaud, and Otto Dietzsch, Stein am Rhein, sh, Switzerland
Filed June 6, 1969, Ser. No. 831,174
Claims priority, application Switzerland, June 8, 1968, 8,632/68; Austria, May 27, 1969, 5,012/69
Int. Cl. B01d *13/00, 13/02;* **C02b** *1/60*
U.S. Cl. 204—301 **14 Claims**



Membrane capillary exchangers including multiple countercurrent exchangers and the processes for making and using them are disclosed in the present application. The membrane capillary is produced by deposition onto an auxiliary core followed by bundling a plurality of the capillaries, introducing a means for holding into the ends of the cores, casting and hardening the means for holding to the ends of the capillaries, removing the mold and then removing the auxiliary cores from the interior of the membranes. The exchanger is operable in the chamber for dialysis liquid treatment.

3,704,224
PROCESS FOR MANUFACTURE OF IMPROVED NEEDLE COKE FROM PETROLEUM
Warner E. Scovill, Lakewood, and Donald R. Day, Garfield Heights, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
No Drawing. Filed Oct. 2, 1970, Ser. No. 77,735
Int. Cl. C10g *9/14*
U.S. Cl. 208—131 **3 Claims**

An improved coke for the production of graphite electrodes is produced from a petroleum coking feedstock containing 0.01% by weight or more of spent cracking catalyst by reducing the spent cracking catalyst content of the petroleum coking feedstock to less than 0.005% by weight prior to the coking of said feedstock. When a small amount of colloidal graphite is added to the petroleum coking stock having less than 0.005% by weight of spent cracking catalyst just before it is coked, an additional improvement in the coke is obtained.

3,704,225
NONSWELLING TEXTURING SPIN FINISH
Barry Michael Shay, Wilmington, Del., assignor to ICI America Inc.
No Drawing. Filed Dec. 8, 1970, Ser. No. 96,250
Int. Cl. D06m *13/00*
U.S. Cl. 252—8.9 **4 Claims**

High-temperature stable alkyl stearate lubricant compositions which are especially useful as spin finishes in producing textured polyester yarns are obtained by forming aqueous emulsion blends with antistatic agents and thermal stabilizing agents using selective emulsifiers such as polyoxyethylene derivatives of sorbitol and sorbitan polyoleates. The finishes are superior in that they do not attack or swell polyurethane belts and cots used in commercially available false twist texturing equipment.

3,704,226
PROCESS FOR THE PREPARATION OF PERMANENTLY MAGNETIZABLE MIXED OXIDES CONTAINING IRON
John W. Geus, Sittard, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
No Drawing. Continuation of application Ser. No. 811,623, Mar. 28, 1969. This application Dec. 21, 1970, Ser. No. 100,450
Claims priority, application Netherlands, Mar. 30, 1968, 6804511
Int. Cl. C04b *35/26, 35/28, 35/32, 35/36*
U.S. Cl. 252—62.56 **1 Claim**

A process for the preparation of permanently magnetizable iron containing mixed oxides by precipitation from an aqueous solution is disclosed. An aqueous solution of a ferrous salt containing also one or more salts of other metals, but no oxidizing agents, is intensively stirred, whereby a precipitate is gradually formed at elevated temperature by hydrolizing urea, likewise present in the solution, to ammonium carbamate, or ammonium carbonate, and the precipitate so formed is subsequently separated from the liquid, washed, dried and, if necessary, heat-treated in contact with air. Preferably the precipitation is carried out in an inert atmosphere. If the precipitate is used for the preparation of a permanently magnetizable mixed oxide to be used on tapes or sheets, the material is subjected to a thermal treatment below 500° C., and for the preparation of moulded objects, the compressed material is subjected to a thermal treatment at temperatures of 1000° C. or over.

3,704,227
DENTURE CLEANSERS
William H. Hill, Stamford, Conn., assignor to Peter, Strong & Company, Inc., New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 210,584, July 17, 1962, Ser. No. 507,705, Nov. 15, 1965, now Patent No. 3,372,125, and Ser. No. 709,900, Mar. 4, 1968, now Patent No. 3,488,288. This application Nov. 20, 1969, Ser. No. 878,562
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 **1 Claim**

Improvements are set forth in the production of denture cleansers containing inorganic peroxy oxygen-liberating

compounds which when added to water cause evolution of oxygen and bubbling. More vigorous bubbling and hence more efficient cleansing of artificial dentures is brought about by the inclusion of catalysts. A particularly adaptable activating material is one which consists of a heavy metal chelate. The shelf-life of a cleanser of the type described is found to be greatly lengthened if it does not contain an excess of the heavy metal component. It is also found advantageous to avoid an excess of the chelating agent. Thus it is preferred to prepare the heavy metal chelate with its component parts in stoichiometric proportions.

3,704,228

WASHING AGENTS CONTAINING A TEXTILE SOFTENER

Hans-Werner Eckert, Dusseldorf, and Johannes Jurgen Perner, Monheim, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,288

Claims priority, application Germany, June 7, 1969, P 19 29 040.5

Int. Cl. C11d *1/52, 1/66;* **D06m** *13/40*
U.S. Cl. 252—117 **18 Claims**

Detergent compositions containing textile softeners consisting essentially of:

(1) From 10% to 80% by weight of a mixture of surface-active agents consisting essentially of:

(a) From 20% to 90% by weight of customary surface-active compounds utilizable in neutral to alkaline textile washing baths selected from the group consisting of anionic surface-active compounds, amphoteric surface-active compounds, non-ionic surface-active compounds, and mixtures thereof, wherein not more than 50% by weight of said surface-active compounds are non-ionic surface-active compounds, and

(b) From 80% to 10% by weight of a textile softener composition of a higher fatty acid monoamide of a hydroxyalkylpolyamine, said higher fatty acids having from 8 to 24 carbon atoms with at least 50% of said higher fatty acids having from 16 to 24 carbon atoms, said hydroxyalkylpolyamine having at least one hydroxyalkyl selected from the group consisting of hydroxyethyl, hydroxypropyl and dihydroxypropyl and at least two hydrogen atoms bonded to nitrogen atoms, said textile softener containing less than 5% by weight of fatty acid partial glycerides, and

(2) From 20% to 90% by weight of other customary components of detergent compositions.

3,704,229

EPOXY RESIN CURING AGENT

Hiroji Tashiro and Tutomu Yamaguchi, Tokyo, Japan, assignors to Toka Shikiso Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 17, 1969, Ser. No. 885,974

Claims priority, application Japan, Dec. 26, 1968, 43/94,989

Int. Cl. C08f *45/72, 51/84*
U.S. Cl. 252—182 **5 Claims**

A novel epoxy resin curing agent curable even in a wet state and having an improved compatibility with tar is prepared by adding acrylic acid ester as compcnent A, to a mixture of at least one of slightly-water-soluble or unsoluble aliphatic amines having primary amines, as component B, and xylene diamine, as component C in the first stage reaction and amidizing one mole of terminal ester groups of said addition products with component C in the second stage reaction. The present curing agent is less toxic and a clear liquid low viscosity and a desired epoxy cured product can be obtained by mixing it with an epoxy resin by freely changing the mixing ratio.

3,704,230

EXOTHERMIC COMPOSITIONS

Domingos Loricchio, Sao Paulo, Brazil, assignor to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Filed Jan. 22, 1971, Ser. No. 108,999

Claims priority, application Brazil, Feb. 17, 1970, 216,800

Int. Cl. B22d *7/10;* **C21c** *7/06*
U.S. Cl. 252—182 **11 Claims**

An exothermic composition, useful for example, in casting cast iron (to keep the iron molten in the header of the mold while the iron within the mold solidifies and contracts, therefore requiring additional molten iron to fill up the mold) comprises silicon carbide; a silicon carbide decomposition catalyst (e.g., lead dioxide, potassium dichromate, or lead chromate); and optionally, such additional ingredients as a combustible organic filler, a silicon carbide decomposition retardant (such as alumina or silica), calcium chloride, and ferrosilicon.

3,704,231

CHEMILUMINESCENT ADDITIVES

Laszlo Joseph Bollyky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of abandoned application Ser. No. 675,141, Sept. 13, 1967, which is a continuation-in-part of application Ser. No. 577,595, Sept. 7, 1966. This application Feb. 16, 1971, Ser. No. 115,734

Int. Cl. C09k *3/00*
U.S. Cl. 252—188.3 **5 Claims**

A chemiluminescent system having as a chemiluminescent reactant (1) aromatic oxalic-type esters or (2) glyoxal-type compounds, which react with a hydroperoxide to produce chemiluminescent light in the presence of a fluorescer, the system including as an additive neutral and basic salts having cations from the group of alkali metal, tetraalkyl and tetraaryl ammonium, arsenium and phosphonium cations which give improved brightness and quantum yield to the system.

3,704,232

PREPARATION OF SULFIDE PHOSPHORS

James O. Frey and Harry L. Marshall, Towanda, and Henry B. Minnier, Dushore, Pa., assignors to GTE Sylvania Incorporated

Filed Sept. 24, 1970, Ser. No. 74,966

Int. Cl. C09k *1/12*
U.S. Cl. 252—301.6 S **3 Claims**

An improved process for producing phosphor compositions having a multivalent metal sulfide host and a source of activator material comprising at least one metal having a tripositive valence which comprises adding at least about 0.5% barium chloride flux material and heating the mixture in an atmosphere of carbon disulfide and an inert gas carrier at a volumetric ratio of carbon disulfide to inert gas of at least about 1:50.

ERRATA

For Classes 252—353 thru 252—524 see:
Patents Nos. 3,704,262 thru 3,704,267

For Classes 252—54.6, 252—62.51 and 252—546 see:
Patents Nos. 3,704,277, 3,704,278 and 3,704,370

3,704,233

O-ACYL-LYSERGOLS AND PROCESS FOR PREPARING THEM

Eckart Eich, Marienborn, and Hans Rochelmeyer, Mainz, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

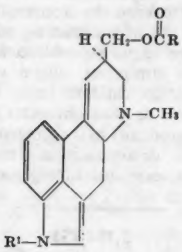
No Drawing. Filed July 14, 1970, Ser. No. 54,861

Claims priority, application Germany, July 17, 1969, P 19 36 410.4

Int. Cl. C07d *43/20*

U.S. Cl. 260—285.5 5 Claims

O-acyl-lysergols of the formula



and their salts with non-toxic acids, which compounds show uterus-contracting and serotonin-antagonistic activity, wherein R is alkyl, haloalkyl, hydroxyalkyl, lower alkoxyalkyl, amino, mono- or di-lower alkylamino, tetramethyleneimino, pentamethyleneimino, alkenyl, cycloalkyl, cycloalkylalkyl, alkylcycloalkyl, phenylalkyl, or furyl; and R^1 is hydrogen or lower alkyl. Method for making the same by reaction of corresponding elymoclavines or lysergols with an acid, RCOOH, or an ester-forming derivative thereof.

3,704,234

SPIRO PYRANO[3,2-f]QUINOLINE-3,1-PYRIDO[3,4-b] INDOLE

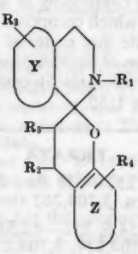
Maximilian von Strandtmann, Rockaway, Marvin P. Cohen, New Milford, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Company

No Drawing. Original application Oct. 24, 1969, Ser. No. 869,335, now Patent No. 3,649,635, dated Mar. 14, 1972. Divided and this application May 17, 1971, Ser. No. 144,259

Int. Cl. C07d *35/10*

U.S. Cl. 260—288 2 Claims

The present invention is concerned with spiropyranopyridines of Formula I:



wherein Y and Z are aromatic or heteroaromatic nuclei, R_1, R_2, R_3, R_4 and R_5 are hydrogen or various substituents such as alkyl, aryl, alkoxy, halogen, etc.

The compounds of this invention are useful as antiarrhythmic agents.

3,704,235

STABLE FREE RADICALS OF THE NITROXIDE TYPE DERIVED FROM TROPANE RING COMPOUNDS

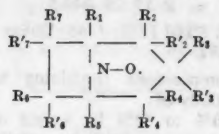
Andre Rassat and Jacques Ronzaud, Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

No Drawing. Filed Jan. 11, 1971, Ser. No. 105,627

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 2 Claims

Free radicals of the nitroxide type constituted by nitrogenous bicyclic compounds having the general formula:



in which R_1, R_2, R'_2, R_4, R'_4, R_5, R_6, R'_6, R_7 and R'_7 are selected from the group formed by hydrogen atoms and organic radicals and R_3 and R'_3 are selected from the group formed by two hydrogen atoms, the groups OH, NH_2, N—OH, N—NH_2, —COOH, —COOH, —$CONH_2$ or constitute with the atom C of the ring the ketone group —C=O.

3,704,236

S-(PYRIDYL)METHYL THIOCARBAMATES

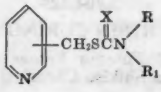
Harry Tilles, El Cerrito, and Mervin E. Brokke, Moraga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Oct. 7, 1968, Ser. No. 765,681, now Patent No. 3,579,525. Divided and this application Nov. 20, 1970, Ser. No. 91,582

Int. Cl. C07d *31/50*

U.S. Cl. 260—293.69 5 Claims

S-(pyridyl)methyl thio- and dithio-carbamates having the formula



in which X is oxygen or sulfur, R and R_1 are independently alkyl, alkenyl, or cyclohexyl and R and R_1 taken together are alkylene and dialkyl substituted alkylene, provided that when X is sulfur and R and R_1 are both alkyl, at least one of the alkyl groups contains 3 or more carbon atoms. The above compounds, as well as those excluded by the proviso, are effective herbicides. Representative compounds are

S-(3-pyridyl)methyl di-n-propylthiocarbamate,
S-(2-pyridyl)methyl di-n-butylthiocarbamate,
S-(4-pyridyl)methyl methylcyclohexylthiocarbamate,
S-(4-pyridyl)methyl ethyl-n-butylthiocarbamate and S-(3-pyridyl)methyl 1 - (5-ethyl-2-methyl-piperidinecarbothioate).

3,704,237

CERTAIN 2-AMIDINO-1,2,3,4-TETRAHYDRO-BENZOTHIENE[2,3-c]PYRIDINES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 875,587, Nov. 10, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 705,892, Feb. 16, 1968, now Patent No. 3,518,277, which in turn is a continuation-in-part of application Ser. No. 621,437, Mar. 8, 1967, now abandoned. This application Apr. 29, 1971, Ser. No. 138,838

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 B 7 Claims

The compounds are derivatives of 1,2,3,4-tetrahydrobenzothieno[2,3-C]pyridine and 1,2,3,4 - tetrahydro-5H-benzothieno[2,3-C]azepine, useful as antipsychotics, antihypertensives, and central nervous system stimulants. Representative compounds disclosed are 2-amidino-1,2,3,4-tetrahydro-5H-benzothieno[2,3-C]azepine and 2-amidino-1,2,3,4-tetrahydrobenzothieno[2,3-C]pyridine.

3,704,238

PROCESS FOR PRODUCING 4,4'-BIPYRIDYL FROM 4,4' - BI(4H)PYRAN OR 4,4' - BIPYRYLENE BY AMMOXIDATION

Roy Dennis Bowden, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 3, 1969, Ser. No. 803,983

Claims priority, application Great Britain, Mar. 15, 1968, 12,643/68

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D 11 Claims

4,4'-bi(4H)pyrans and 4,4'-bipyrylenes are disclosed. These products are made by reducing the corresponding pyrylium salt whereby two molecules of the salt are coupled together to form the bi-(4H)-pyran and the bi-pyrylene. The 4,4'-bi(4H)-pyran or 4,4'-bipyrylene may be treated in the liquid phase with ammonium ions or ammonia in the presence of molecular oxygen to produce a 4,4'-bi-pyridyl.

3,704,239

CERTAIN THIAZOLE[3,2-a]BENZIMIDAZOLE COMPOUNDS

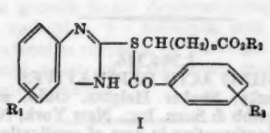
Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,378

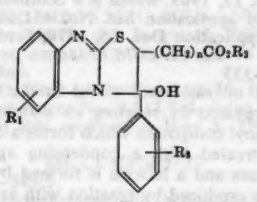
Int. Cl. C07d *99/08*

U.S. Cl. 260—306.7 8 Claims

Compounds of Formula I and Formula II have been prepared which have CNS depressant and antitubercular activity:



I



II

wherein

R_1 is selected from the group consisting of hydrogen, halogen, (lower)alkyl, trifluoromethyl, nitro and amino;

R_2 is selected from the group consisting of hydrogen and (lower)alkyl;

R_3 is selected from the group consisting of hydrogen, halogen, (lower)alkyl, trifluoromethyl, nitro, amino, phenyl, halophenyl and (lower)alkylphenyl;

n is an integer of from 1 to 3;

and the pharmaceutically acceptable acid addition salts thereof.

3,704,240

3-SUBSTITUTED-4-HYDROXY - 2 - SUBSTITUTED IMINO - 4 - PHENYL-5-THIAZOLIDINE ALKYL CARBOXYLIC ACIDS AND THEIR ALKYL ESTERS

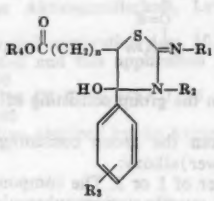
Peter H. L. Wei, Springfield, and Ronald J. McCaully, Malvern, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,402

Int. Cl. C07d *91/14*

U.S. Cl. 260—306.7 7 Claims

Novel compounds of the formula:



have been prepared which have antitubercular activity.

3,704,241

4-PYRAZOLE ACETIC ACID COMPOUNDS

Shunsaku Noguchi and Shoji Kishimoto, Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Higashiku, Osaka, Japan

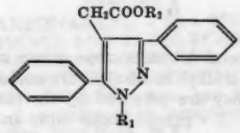
No Drawing. Filed Nov. 17, 1970, Ser. No. 90,421

Claims priority, application Japan, Nov. 17, 1969, 44/91,901

Int. Cl. C07d *49/18*

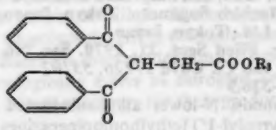
U.S. Cl. 260—310 R 8 Claims

4-pyrazole acetic acid or esters thereof of the formula:



(I)

wherein R_1 is hydrogen, lower alkyl, aryl or aralkyl, the aromatic ring of the said aryl or aralkyl being substituted or unsubstituted, and R_2 is hydrogen or alkyl are prepared by reacting a β,β-dibenzoylpropionate of the formula:



(II)

wherein R_3 represents alkyl, with a hydrazine of the formula:

$$R_1—NHNH_2 \quad \text{(III)}$$

wherein R_1 has the same meaning as above, and, if desired, hydrolyzing the thus obtained compound. The compounds possess anti-inflammatory and analgesic action.

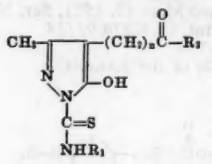
3,704,242

5 - HYDROXY-3-ALKYL-1-(THIOCARBAMOYL OR ALKYLTHIOCARBAMOYL)-PYRAZOLE-4-ALKANOIC ACID DERIVATIVES

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,952
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R **7 Claims**

Novel compounds of the formula



wherein

R_1 is selected from the group consisting of hydrogen and (lower)alkyl;

R_2 is selected from the group consisting of hydroxy, amino and (lower)alkoxy;

n is a whole integer of 1 or 2. The compounds are active as inhibitors of mycobacterium tuberculosis.

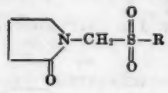
3,704,243

N-(SUBSTITUTED SULFONYLMETHYL)-2-PYRROLIDINONES

Harlan B. Freyermuth and David I. Randall, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,028
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 SF **7 Claims**

Sulfonylmethyl derivatives of N-methyl-2-pyrrolidinone of the structural formula:



wherein R represents a hydrocarbon group such as alkyl, aryl, cycloalkyl, aralkyl or alkaryl, are useful as dyestuff intermediates. They are prepared by the reaction of N-hydroxymethyl - 2 - pyrrolidinone with an appropriate sulfinic acid.

3,704,244

N-LOWER ALKYL-SUBSTITUTED N'-[β-(2',5'-DIPHENYLPYROLYL - 1')] ETHYLHOMOPIPERAZINES

Akihide Kohda, Gifu, and Shigeharu Kohno, Tohru Takahashi, and Hachiro Sugimoto, Tokyo, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,165
Int. Cl. C07d *27/26, 53/02*
U.S. Cl. 260—326.9 **8 Claims**

New compounds, N-lower alkyl-substituted N'-[β-(2', 5' - diphenylpyrrolyl-1')]ethylhomopiperazines and pharmacologically acceptable acid-addition salts thereof. The compounds possess not only anti-histamine activity but also antagonising effect to the S. R. S. (Slow Reacting Substance). They are therapeutically useful for bronchodilation and for treatment of asthma attack. The compounds are advantageously administrated in a form of their pharmacologically acceptable water soluble salts.

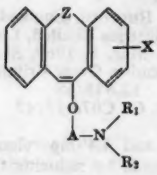
3,704,245

TRICYCLIC ENOL ETHER COMPOUNDS

Suminori Umio, 7 Midorigaoka, Aza, Yamanohara, Kawanishi-shi, Japan; Ikuo Ueda, 3–2–4 Higashikyuhoji, Yao-shi, Japan; Yoshinari Sato, 2–2–10 Midorigaoka, Ikeda-shi, Japan; and Shizuo Maeno, 3–22 Kikawanishino-cho, Higashiyodogawa-ku, Osaka-shi, Japan

No Drawing. Continuation-in-part of application Ser. No. 799,092, Feb. 13, 1969. This application Aug. 15, 1969, Ser. No. 850,660
Claims priority, application Japan, Feb. 16, 1968, 43/9,684
Int. Cl. A61k *27/00*; C07d *9/00, 67/00*
U.S. Cl. 260—327 B **6 Claims**

Tricyclic enol ether compounds of the general formula:



wherein X is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylthio, di(lower)alkylsulfamoyl, nitro, cyano, amino or trifluoromethyl; Z is oxy, thio or lower alkylimino; A is lower alkylene; and R_1 and R_2 are each lower alkyl or, when bound together intervening or not oxygen, nitrogen, lower alkylimino, hydroxy(lower)alkylimino, lower alkoxycarbonylimino, lower alkoxycarbonyl (lower)alkylimino, formylimino, lower alkanoyloxy (lower) alkylimino or lower alkanoylimino, the group of the formula:

represents a saturated 5 to 7-membered nitrogen-containing heterocyclic group. These compounds are useful as psychotropic and neutrotropic agents, particularly as tranquilizers.

3,704,246

AMINO ACID DERIVATIVES

Miklos Bodanszky, Shaker Heights, Ohio, assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 798,790, Feb. 12, 1969, which is a continuation-in-part of abandoned application Ser. No. 451,609, Apr. 28, 1965. This application Dec. 16, 1970, Ser. No. 98,924
Int. Cl. C07d *87/54*
U.S. Cl. 260—333 **9 Claims**

New lactone intermediates useful in the synthesis of peptides are prepared by reacting an α-amino acid with an active carbonyl compound which forms a Schiff's base. The latter is treated with a condensing agent so that cyclization occurs and a lactone is formed from which a peptide may be produced by reaction with an amino acid ester removal of the protecting groups.

3,704,247

METHOD FOR SYNTHESIZING FISH-KILLING SUBSTANCES, AND FISH KILLERS

Katsura Munakata, % Department of Agricultural Chemistry, Faculty of Agriculture, Nagoya University, 1 Furocho, Chikusa-ku, Nagoya, Japan

No Drawing. Original application Mar. 28, 1968, Ser. No. 717,037. Divided and this application Nov. 23, 1970, Ser. No. 92,143

Claims priority, application Japan, Mar. 30, 1967, 42/20,186

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 2 Claims

A fish-killing active substance contained in *Justicia Hayatai* var. *decumbens* which is denominated as Justicidin B, i.e. 4-(3',4'-methylenedioxyphenyl)-6,7-dimethoxy - 2 - hydroxymethyl - 3 - naphthoic acid lactone, is synthesized by condensing α - acetyl - γ-(3,4-dimethoxybenzyl)-γ-butyrolactone with 3,4-methylenedioxybenzoyl chloride, deacetylating the resulting corresponding α-acetyl-α - (3,4 - methylenedioxybenzoyl)-γ-butyrolactone, treating the resulting deacetylation compound, that is α-(3,4-methylenedioxybenzoyl) - γ - butyrolactone, with hydrogen chloride-saturated methanol, and then reacting the resulting compound with potassium bisulfate to obtain a 1,2 - dihydro - 6,7-dimethoxy-4-(3',4'-methylenedioxyphenyl) - 2 - hydroxymethyl - 1,2 - dihydro - 3 - naphthoic acid lactone, followed by dehydrogenation. The TLm of the present compound toward *Oryzias latipes* is 0.028 p.p.m., and the dihydro compound also shows a marked fish-killing activity.

3,704,248

ZEARALENONE REDUCTION

Edward B. Hodge, Terre Haute, Ind., assignor to Commercial Solvents Corporation

No Drawing. Filed Apr. 2, 1970, Ser. No. 25,266

Int. Cl. C07d *9/00*

U.S. Cl. 260—343.2 F 5 Claims

A method for reducing zearalenone to zearalanol using a Raney nickel catalyst wherein the ratio of the low melting diastereoisomer to the high melting point diastereoisomer of zearalanol in the product is increased. Zearalenone is catalytically reduced with hydrogen and in the presence of a lower alkanol which is substantially anhydrous and a strong base.

3,704,249

SYNTHESIS OF THE BIOLOGICALLY ACTIVE DIASTEREOISOMER OF (−) ZEARALANOL

Robert F. Czaja, Elizabeth, Victor J. Grenda, Warren, and Earl M. Chamberlin, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 1, 1969, Ser. No. 821,143

Int. Cl. C07d *9/00*

U.S. Cl. 260—343.2 F 7 Claims

The active growth factor diastereoisomer of 6-(6,10-dihydroxy - undecyl) - β - resorcylic acid - μ - lactone or (−) zearalanol is prepared by stereospecific reduction of the carbonyl moiety of zearalanone, zearalenone, and diether derivatives thereof.

3,704,250

OCTALONE CARBOXYLIC ACID ANHYDRIDES

Abraham Weber, Paris, and Jacques J. Frossard, Champigny, France, assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Original application Aug. 13, 1964, Ser. No. 389,489, now Patent No. 3,532,742, dated Oct. 6, 1970. Divided and this application June 5, 1970, Ser. No. 57,402

Int. Cl. C07d *5/32*

U.S. Cl. 260—346.3 2 Claims

Octalone carboxylic acids and their derivatives, which in part are useful as choleretic agents.

3,704,251

PRODUCTION OF PHENYL-MALEIC ANHYDRIDE BY CATALYTIC VAPOR PHASE OXIDATION OF BIPHENYL OR SEC-BUTYL BENZENE

Theodor Vrbaski, Harvey, Bernard C. Vitchus, Riverdale, and Robert Koncos, Park Forest, Ill., assignors to Sinclair Oil Corporation

No Drawing. Filed July 22, 1968, Ser. No. 746,294

Int. Cl. C07c *63/02*

U.S. Cl. 260—346.8 14 Claims

A process for the catalytic vapor phase oxidation of an aromatic hydrocarbon, which can be biphenyl or sec-butyl benzene, to produce phenyl-maleic anhydride which comprises oxidizing said aromatic hydrocarbon in the vapor phase at a temperature of about 350 to 480° C. with molecular oxygen-containing gas in the presence of an oxidation catalyst comprising an oxide of a Group V*b* metal, i.e. the vanadium group, which can be promoted with potassium sulfate.

3,704,252

ANTHRAQUINONE DYES

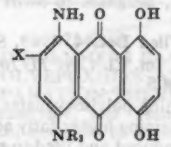
Hans-Samuel Bien, Burscheid, Walter Hohmann and Heinrich Vollmann, Leverkusen, and Heinrich Leister, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Original application Aug. 10, 1966, Ser. No. 571,431. Divided and this application May 25, 1970, Ser. No. 40,360

Int. Cl. C09b *1/54, 1/56*

U.S. Cl. 260—380 7 Claims

Halogenated dyes obtained by the halogenation of dyes of the formula



where R is hydrogen or optionally substituted alkyl or aryl; X is optionally substituted alkoxy, alkylthio, phenoxy, phenylthio benzyloxy, benzylthio or cyclohexylthio; containing 0.1 to 1 halogen atom per anthraquinone molecule having been prepared.

3,704,253

13 - POLYCARBONALKYL - 16 - METHYLGONA-1,3,5(10)-TRIENES AND 13-POLYCARBONALKYL-16-METHYLGON - 4 - EN-3-ONES AND INTERMEDIATES FOR THEIR PRODUCTION

Reinhardt P. Stein, Conshohocken, and Herchel Smith, Bryn Mawr, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 852,455, Aug. 22, 1969, which is a continuation-in-part of abandoned application Ser. No. 818,126, Apr. 21, 1969, which in turn is a continuation-in-part of abandoned application Ser. No. 767,809, Oct. 15, 1968. This application Sept. 23, 1970, Ser. No. 74,892

Int. Cl. C07c *167/20*

U.S. Cl. 260—397.4 5 Claims

Novel 13 - polycarbonalkyl - 16-methylgona-1,3,5(10)-trienes and 13-polycarbonalkyl-16-methylgon-4-en-3-ones and intermediates for their production are described which are pharmacologically active as estrogens and progestins respectively. Novel processes for their production are also described.

3,704,254

PROCESS FOR SEPARATING PHOSPHATIDES

Rajindra Aneja, Welwyn Garden City, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Nov. 27, 1968, Ser. No. 779,589
Int. Cl. A23j 7/00; C07f 9/02
U.S. Cl. 260—403 10 Claims

N-acylphosphatides, for instance N-acetylcephalin, are separated from phosphatides without an acylatable amino group, for instance lecithin, by making a mixture containing them basic with a nitrogen base, for example triethylamine, to the equivalent of pH at least 8.5 under aqueous conditions and solvent-fractionating with acetone or methyl acetate.

3,704,255

POLYESTERS

Robert A. Braun, Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 776,824, Nov. 18, 1968. This application Mar. 3, 1971, Ser. No. 120,775
Int. Cl. C07c 69/76; C08g 17/02
U.S. Cl. 260—404.8 5 Claims

The polymers of this invention are made by first reacting an anhydride with a polyol, and then reacting the product with a hydroxyl terminated polyester. The polymers are useful as film-formers in coating compositions.

3,704,256

FLAME-RESISTANT POLYURETHANES

Robert L. Shone, Palatine, Ill., and Thomas W. Findley, Westbury, N.Y., assignors to Swift & Company, Chicago, Ill.

No Drawing. Filed Dec. 4, 1969, Ser. No. 882,338
Int. Cl. C09f 11/10
U.S. Cl. 260—404.5 4 Claims

Halogen-containing polyisocyanates, obtained by reacting a halogen-containing higher fatty acid ester and a polyisocyanate, are produced and used to prepare flame-resistant, non-rigid, cellular materials such as polyurethane foams having minimum shrinkage on curing.

3,704,257

N-CYCLOHEXYL-N-(2-CYANOETHYL)OLEAMIDE AS A PLASTICIZER

Robert R. Mod, Frank C. Magne, and Evald L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application Oct. 12, 1967, Ser. No. 683,060, which is a division of application Ser. No. 529,652, Feb. 24, 1966, now Patent No. 3,403,126. Divided and this application Nov. 13, 1969, Ser. No. 876,554
Int. Cl. C09f 7/00
U.S. Cl. 260—404.5 1 Claim

The invention provides N - cyclohexyl - N - (2 - cyanoethyl)oleamide as a plasticizer for vinyl chloride resins.

3,704,258

ENOL ETHER INTERMEDIATES FOR JUVENILE HORMONES AND ANALOGS

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Sept. 18, 1970, Ser. No. 73,599
Int. Cl. C07c 69/66; A01n 9/24
U.S. Cl. 260—410.9 R 9 Claims

Stereospecific syntheses of the natural juvenile hormones and analogs and novel intermediates.

3,704,259

TRIS(BICYCLOHEPTYL)CHROMIUM

Barton K. Bower, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,015
Int. Cl. C07f 11/00
U.S. Cl. 260—438.5 R 2 Claims

Organo trivalent chromium compounds are described wherein the chromium is linked to the bridgehead carbons of three bicyclic radicals, namely a 1-bicyclo-[2·2·1]-heptyl radical that contains two methyl groups attached to carbons adjacent to the bridgehead carbon, i.e., in the 2 and/or 6 position. A typical compound is tris(4-camphyl) chromium. These compounds are useful as catalysts for the polymerization of 1-olefins and can be used alone or in combination with organometallic activators such as alkylaluminum compounds.

3,704,260

PURIFICATION OF DIMETHYLHYDROGENCHLOROSILANE

Michael J. Wynn, Rexford, N.Y., assignor to General Electric Company

Filed Aug. 27, 1971, Ser. No. 175,489
Int. Cl. C07f 7/20
U.S. Cl. 260—448.2 E 12 Claims

Process for purifying dimethylhydrogenchlorosilane contaminated with 2-methylbutene-2 which comprises subjecting the impure dimethylhydrogenchlorosilane to a redistribution reaction and then subjecting it to distillation.

3,704,261

PREPARATION OF SILICON HYDRIDES

Abe Berger, Schenectady, and Frederick M. Lewis, Burnt Hills, N.Y., assignors to General Electric Company

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,401
Int. Cl. C07f 17/08
U.S. Cl. 260—448.2 E 15 Claims

A method is provided for converting organosilicon halides, for example, halosilanes and bis(halosilyl)hydrocarbons, to the corresponding hydrides. Silicon halide reduction is effected by utilizing certain organometallic hydrides.

3,704,262

SURFACTANT FOR ELECTROLYTE-CONTAINING PROCESSING SOLUTIONS

Joseph A. Komor, Allentown, Pa., assignor to GAF Corporation, New York, N.Y.

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,197
Int. Cl. B01f 17/02, 17/14
U.S. Cl. 252—353 2 Claims

Surfactant compositions and baths for specific textile wet-processing operations are disclosed. The compositions exhibit surfactant qualities even in the presence of up to ten percent (10%) electrolytes including alkalies in the baths and are not adversely affected by water hardness, oxidative reagents or elevated bath temperatures. The compositions includes a blend of phosphate esters of 8-carbon alcohols with soluble sulphate esters of alkoxylated alcohols and alkyl phenols.

3,704,263

HYDROLYSIS OF ETHYL SILICATE

Jacob Rosin, Maplewood, N.J., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 244,261, July 7, 1965, which is a continuation-in-part of application Ser. No. 462,134, Dec. 13, 1962. This application Feb. 28, 1969, Ser. No. 803,396
Int. Cl. B01g 13/00
U.S. Cl. 252—309 3 Claims

Method of preparing a stable solution of hydrolyzed ethyl silicate in ethanol having special utility as a binder

for comminuted solids in mold making. The method is particularly distinguished in that an extremely low concentration of acid catalyst is employed in the hydrolysis.

3,704,264

ENCAPSULATION OF MONOMERIC MATERIALS

Jeremy W. Gorman, Simsbury, Conn., assignor to Loctite Corporation, Newington, Conn.

No Drawing. Continuation of abandoned application Ser. No. 699,382, Jan. 22, 1968. This application Dec. 16, 1970, Ser. No. 98,884

Int. Cl. B01j *13/02*; B44d *1/02*

U.S. Cl. 252—316 12 Claims

Single component microcapsules can be prepared by forming or injecting small, discrete portions of liquid monomeric composition capable of homopolymerization in a fluid containing a polymerization catalyst. A shell of homopolymer forms around the core of the liquid monomeric composition. The liquid monomeric composition employed is an anaerobic composition consisting essentially of a polymerizable acrylate ester monomer and an organic hydroperoxide polymerization initiator therefor.

3,704,265

SINTERED INORGANIC PHOTOCONDUCTIVE ELEMENTS AND THEIR METHOD OF PREPARATION

Shigeaki Nakamura, Tadao Nakamura, and Tadao Kohashi, Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Mar. 3, 1970, Ser. No. 16,134

Claims priority, application Japan, Mar. 7, 1969, 44/18,249

Int. Cl. C03g *5/00*

U.S. Cl. 252—501 6 Claims

Process for preparing sintered photoconductive elements from material which contains II–VI group compounds as a host component, I*b* group element as an activator and VII*b* or III*b* group element as a coactivator, which material is sintered in the presence of predetermined amounts of vitreous enamel and solvent flux.

The process provides photoconductive elements of an appropriate geometry and thickness and with satisfactory photosensitivity and stable photoconductive properties.

3,704,266

BARIUM TITANOZIRCONATE SEMICONDUCTING CERAMIC COMPOSITIONS

Hisayoshi Ueoka, Ichikawa-shi, Kazuo Horii, Hunabashi-shi, and Kazumasa Umeya and Syunsuke Maruyama, Ichikawa-shi, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1969, Ser. No. 877,768

Claims priority, application Japan, Nov. 18, 1968, 43/83,968

Int. Cl. C04b *33/00*; H01b *1/06*

U.S. Cl. 252—520 6 Claims

Ceramic semiconducting compositions are provided herein in which the compositions consist primarily of barium titanozirconate solid solutions, represented by the formula $Ba(Ti, Zr)O_3$ obtained by substituting part of $BaTiO_3$ with $BaZrO_3$ and in which small amounts of Bi_2O_3 and TiO_2 are added thereto, such that the range of proportions of the compositions fall within the region bounded by the line A–B–C–D–E–F–G and in which about 0.01 to 2 mol percent of Mn ions are added thereto. The disclosure also provides for a method of producing compositions having the aforementioned proportions by mixing the various ingredients together, pressing them into the desired shape and then sintering the compositions in air followed by reducing the compositions in a reducing atmosphere. Ceramics produced from such compositions contain a large capacitance, among other desirable properties, which make them suitable for use as by-pass capacitors or for use in various discriminating circuits.

3,704,267

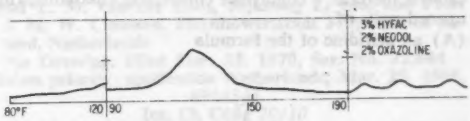
TERNARY FOAM CONTROL COMPOSITION AND BUILT ANIONIC DETERGENT COMPOSITION CONTAINING SAME

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of applications Ser. No. 41,359 and Ser. No. 41,601, both May 28, 1970. This application May 28, 1970, Ser. No. 41,308

Int. Cl. B01d *19/04*; C11d *3/065*

U.S. Cl. 252—524 25 Claims



A built anionic detergent composition having an inverse foam-to-temperature relationship is disclosed, as well as a ternary composition for accomplishing this relationship when added to the detergent system. The inverse foam-to-temperature relationship is provided by a synergistic mixture of a C_8–C_{30} fatty acid, a particular group of oxazolines, and a C_{12}–C_{20} polyethoxylated linear alcohol containing from about 10 to 50 moles of ethylene oxide.

3,704,268

CURABLE, SOLID POLYMERS BASED ON CYCLOALIPHATIC POLYEPOXIDES AND A METHOD FOR THE PREPARATION THEREOF

John Wynstra, Somerville, and Thomas B. Gibb, Jr., Murray Hill, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,030

Int. Cl. C08g *30/00*

U.S. Cl. 260—2 EP 34 Claims

This invention relates to curable, solid polymers, based on cycloaliphatic polyepoxides, and to a method for the preparation thereof by reacting a liquid cycloaliphatic polyepoxide with a polyfunctional, acidic co-reactant having a pKa value of less than about 8, such as polycarboxylic acid or a polyhydric phenol, in a reaction medium containing a tertiary amine. The curable, solid polymers of this invention can be used in molding, coating and laminating applications and cured to infusible products characterized by excellent properties such as electrical properties.

3,704,269

FOAMS AND PROCESS OF MAKING

Harlan G. Freeman and Maurice F. Gillern, Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Jan. 22, 1971, Ser. No. 109,048

Int. Cl. C08j *1/16*

U.S. Cl. 260—2.5 F 16 Claims

Disclosed herein is a process of making thermosetting cellular foams, and the insoluble infusible foamed products made therefrom for use as insulating barriers in building construction and other applications where light weight insulating materials are needed. A foaming agent is blended into a liquid resin comprising the reaction product of (1) an aldehyde condensation polymer having reactive alkylol groups, modified by a nitrogen-containing

compound and (2) an aldehyde or aldehyde-polyepoxide mixture. The resinous compositions form an insoluble, infusible, cured foam in 20 to 200 seconds at room temperature, making them useful in foaming-in-place applications.

3,704,270

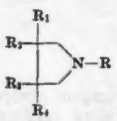
PROCESS FOR PREPARING POLYURETHANES

Prella M. Phillips, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,507
Int. Cl. C08g *22/38*
U.S. Cl. 260—77.5 AC **11 Claims**

A process for preparing polyurethane compositions by reacting a compound having a plurality of active hydrogen atoms with a compound having a plurality of isocyanate or isothiocyanate groups in the presence of, as a catalyst therefor, a copolymer comprising alternating ring-opened units of

(A) an aziridine of the formula

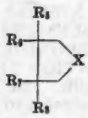


wherein

(1) R is an inert organic group;

(2) R_1, R_2, R_3 and R_4 are hydrogen, alkyl, aryl or aralkyl groups, at least two of them being hydrogen; and

(B) A vicinal epoxide or episulfide of the formula



wherein

(1) X is oxygen or sulfur;

(2) R_5, R_6, R_7 and R_8 are hydrogen, alkyl, aryl, alkaryl, aralkyl, alkenyl, alkoxyalkyl, alkenyloxyalkyl, or R_6 and R_7 join to form a 5 or 6 membered cycloalkyl group, at least two of them being hydrogen.

3,704,271

POLYOLEFIN-STARCH

Helmut F. Prahl, Middleton, Wis., and Frederick M. Hart, Kent, Wash., assignors to Dynatron Research Corporation, Madison, Wis.

Continuation-in-part of application Ser. No. 735,045, June 6, 1968. This application Oct. 29, 1970, Ser. No. 85,041
Int. Cl. C08f *25/00*
U.S. Cl. 260—17.4 GC **18 Claims**

A polyolefin-modified starch where an olefin is polymerized directly upon the surface of starch to yield a starch/polyolefin composite (SPS). SPS is prepared by polymerizing an olefin monomer on the surface of starch upon which a suitable catalyst has been adsorbed, preferably a catalyst of the Ziegler-Natta type, i.e. an organometallic transition metal catalyst system. These surface polymerized polyolefin starches (SPS) are useful in a wide variety of applications including their use in water-resistant adhesives and binders, paper sizes and coatings, textile sizes, paint extenders, and a wide variety of other uses.

3,704,272

CONCENTRATION OF POLYTETRAFLUOROETHYLENE AQUEOUS DISPERSION

David Alan Holmes, Vienna, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 15, 1970, Ser. No. 72,497
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 F **10 Claims**

Polytetrafluoroethylene aqueous dispersion having a pH of at least 8.0 is concentrated by dissolving in the dispersion a sufficient amount of an ethoxylated aliphatic alcohol which has a cloud point of no greater than 45° C. to cause the dispersion to form two layers upon heating at temperatures up to 45° C., decanting the upper layer, followed by dissolving in the lower layer sufficient ethoxylated aliphatic alcohol having a cloud point of at least 10° C. greater than that of the first mentioned ethoxylated aliphatic alcohol and in no event less than 50° C.

3,704,273

FLAME RESISTANT LATEX AND EMULSION SYSTEMS AND THE PRODUCTS FORMED THEREFROM

William C. Arney, Jr., St. Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 11, 1970, Ser. No. 36,441
Int. Cl. C08g *51/24;* C09d *5/18*
U.S. Cl. 260—29.4 R **3 Claims**

Latex and emulsion systems rendered highly flame resistant by treatment with certain phosphorus polyol compounds combined with a flame resistance enhancement agent. Halogen containing (particularly bromine) compounds, such as tetrabromophthalic anhydride, and nitrogen containing compounds, such as dicyanamide, have been found to be extremely effective flame resistance enhancement agents. By the aforementioned treatment of latex and emulsion systems, for example, acrylic crushed foam coatings on fiberglass fabric can be made flame resistant to a degree not achieved heretofore.

3,704,274

METHOD OF INCREASING THE SCORCH LIFE OF BUTYL RUBBER

John E. Callan, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Dec. 18, 1970, Ser. No. 99,687
Int. Cl. C08f *41/12, 45/28, 45/58*
U.S. Cl. 260—33.6 AQ **15 Claims**

A solution is prepared of butyl rubber and a phenol curing resin in an organic solvent, and the solvent is then evaporated to provide dry butyl rubber having the resin intimately dispersed therein. Compounds produced from this resin-containing rubber are characterized by a scorch life which is considerably longer than that which is achieved by conventional dry mixing of the rubber with the curing resin. This new process can be used to particular advantage in the manufacture of curing bags which are used to apply internal heat and pressure to pneumatic vehicle tires during the vulcanization thereof.

3,704,275

THERMOPLASTIC MOLDING COMPOSITIONS ON THE BASIS OF POLYOXYMETHYLENES

Karlheinz Burg, Lagenhain, Ernst Wolters, Frankfurt am Main, Harald Cherdron, Wiesbaden, and Hans-Joachim Leugering, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,722
Claims priority, application Germany, Aug. 7, 1969, P 19 40 132.2
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 AL **11 Claims**

Thermoplastic molding compositions on the basis of polyoxymethylenes are provided which, besides the poly-

oxymethylenes, may contain polymers of varying composition with a definite size of the particles as dispersed phase and which are nucleated with such an amount of inorganic nucleating agent that the size of the polyoxymethylene spherulites formed under definite conditions is within a limited range. The moulding compositions are suitable for the manufacture of shaped articles of any kind and have improved mechanical properties.

3,704,276

PROCESS FOR THE PREPARATION OF ELASTOMERIC COMPOSITION CONTAINING METHANOL TREATED CARBON BLACK

William W. Gotshall, Orchard Lake, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Filed Aug. 10, 1970, Ser. No. 62,412
Int. Cl. C08c *11/02, 11/18;* **C08d** *9/00*
U.S. Cl. 260—41.5 R **9 Claims**

Improvements in physical properties of vulcanizable elastomers containing carbon blacks having pH's below 7, e.g., channel blacks, can be achieved by mixing from about 0.25 to about 10% by weight of methanol with the carbon blacks before compounding of the elastomeric composition.

3,704,277

POLYPHENYL ETHER LUBRICATING COMPOSITIONS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 3, 1971, Ser. No. 139,975
The portion of the term of the patent subsequent to July 18, 1989, has been disclaimed
Int. Cl. C10m *1/24, 1/30*
U.S. Cl. 252—54.6 **5 Claims**

Composition comprising polyphenyl ethers or mixtures thereof and perfluoro aliphatic dibasic acids exhibit improved lubricating properties over wide temperature ranges.

3,704,278

ANIONIC DOPED DIVALENT EUROPIUM CHALCOGENIDES

Merrill W. Shafer, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of abandoned application Ser. No. 15,710, Mar. 2, 1970. This application June 22, 1971, Ser. No. 155,595
Int. Cl. C04b *35/50*
U.S. Cl. 252—62.51 **14 Claims**

The invention relates to anionic doped divalent europium chalcogenides. The divalent ions ($O^=$, $S^=$, $Se^=$, or $Te^=$) are partially substituted for by monovalent halide ions such as (F^-, Cl^-, Br^-, or I^-) in the magnetically ordered europium chalcogenides. The substitution of halide ions for the chalcogen ions alters the properties of the host chalcogenide in several ways, including, the ferromagnetic Curie temperature, resistivity, metallic-to-semiconducting transition and photomagnetic or photoconductive effects.

3,704,279

PRODUCTION OF HALOGEN-CONTAINING POLYARYL ESTERS

Roshdy Ismail, Neunkirchen, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Postfach, Germany

No Drawing. Filed July 28, 1971, Ser. No. 166,686
Claims priority, application Germany, Aug. 1, 1970, P 20 38 287.0; Apr. 29, 1971, P 21 21 093.5
Int. Cl. C08g *17/003*
U.S. Cl. 260—61 **12 Claims**

In the production of halogen-containing polyaryl esters by the polycondensation of halogen-containing diphenols and aromatic acid dichlorides in the presence of a catalyst comprising a tertiary amine, an acid amide or mixtures thereof, the improvement which comprises effecting the condensation in the presence of about 0.001 to 50 mole-percent based on the acid dichloride, of at least one activator selected from the group consisting of magnesium compounds, and oxides, chlorides or hydroxychlorides of Cu, Zr, Sn, Ti, V, Pb and Fe. The condensation is preferably effected in solution, using as activated CuO, CuCl, $ZrCl_4$, $SnCl_2$, $TiCl_4$, $VOCl_3$, PbO, Fe_2O_3 or an alloy of Mg, Cu, Zr, Sn, Ti, V, Pb or Fe. In this manner high molecular weights can be attained in short reaction times.

3,704,280

ANIONIC CATALYTIC POLYMERIZATION OF LACTAMS IN THE PRESENCE OF AN ORGANIC ISOCYANATE AND A POLYETHER

Jozef L. M. van der Loos, Rijksweg Z, 146, and Peter J. M. W. Claassen, Eisenhowerstraat 373, both of Sittard, Netherlands

No Drawing. Filed Mar. 25, 1970, Ser. No. 22,684
Claims priority, application Netherlands, Mar. 25, 1969, 6904544
Int. Cl. C08g *20/10*
U.S. Cl. 260—77.5 AM **6 Claims**

A process is disclosed for the anionic catalytic polymerization of lactams or mixtures of lactams in which an isocyanate compound is used as a promoter conducted in the presence of a polyether soluble in molten lactam. The resulting polymerization reaction occurs rapidly in the order of minutes, producing a polyamide of very high impact strength.

3,704,281

MOLDING MATERIALS BASED ON EPOXIDE COMPOUNDS AND PROCESS

Herbert Saran and Manfred Budnowski, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie. GmbH, Dusseldorf-Holthausen, Germany

No Drawing. Continuation of abandoned application Ser. No. 753,782, Aug. 19, 1968. This application Mar. 8, 1971, Ser. No. 122,174
Claims priority, application Germany, Sept. 2, 1967, H 63,774
Int. Cl. C08g *30/02, 30/12, 30/14*
U.S. Cl. 260—77.5 NC **4 Claims**

This invention relates to a hardenable molding material based on organic compounds containing more than one epoxide group in the molecule consisting of (1) a prereaction product of (a) a mixture of organic compounds containing more than one epoxide group in the molecule, said mixture containing from 66⅔% to 100% of crystalline triglycidyl isocyanurate, and (b) an amine in such a proportion that from 8% to 30% of the epoxide groups in said mixture of organic compounds is reacted with the amine groups of said amine and (2) an epoxide resin hardener. The invention also relates to the process of preparing said prereaction product and the hardened epoxide resin produced from said molding material.

3,704,282

CATECHOLAMINE ANTIGENS AND ANTIBODIES SPECIFIC THEREFOR

Sidney Spector, 12 Troy Drive, Livingston, N.J. 07039

No Drawing. Continuation-in-part of application Ser. No. 826,268, May 20, 1969. This application Apr. 9, 1971, Ser. No. 132,823
Int. Cl. C08g *20/38;* **C08h** *1/00*
U.S. Cl. 260—78 A **6 Claims**

Catecholamine antigens are prepared by coupling catecholamine haptens to immunogenic carrier materials. In preferred embodiments, proteins or polypeptides are used as carrier materials. These antigens produce immunological effects when injected into host animals, including the formation of anticatecholamine antibodies.

These resulting antibodies are useful in bioanalytical techniques for the determination of catecholamine based activity in biological systems.

3,704,283

PROCESS FOR THE PRODUCTION OF SULPHUR-MODIFIED POLYCHLOROPRENES WITH IMPROVED STORAGE LIFE

Rudolf Mayer-Mader, Cologne, and Ernst Schwinum, Leichlingen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 5, 1971, Ser. No. 104,131
Claims priority, application Germany, Jan. 24, 1970, P 20 03 147.4
Int. Cl. C08g *33/00*
U.S. Cl. 260—79 **6 Claims**

A process for the production of sulphur-modified chloroprene polymers by emulsion polymerising chloroprene, 0 to 20% by weight, based on total monomers, of an ethylenically unsaturated copolymerisable compound, and 0.1 to 2% by weight, based on total monomers of sulphur wherein the copolymerisation reaction is carried out in the presence of from 0.5 to 5% by weight, based on total monomers of a water-soluble amine of the formula

$$R^2\text{—}N\text{—}R^3 \quad (R^1 \text{ above } N)$$

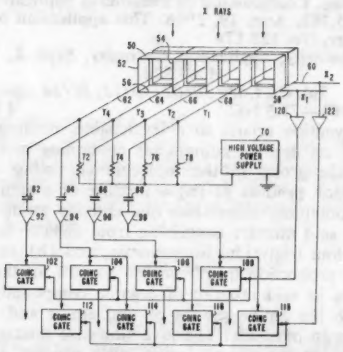
in which R^1 and R^2 each represents an hydroxyalkyl group with 2 to 5 carbon atoms and R^3 has the same meaning as R^1 and R^2 or represents a methyl group.

3,704,284

X-RAY POSITION DETECTOR

Gordon Garmire, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Dec. 4, 1970, Ser. No. 95,217
Int. Cl. G01t *1/18;* H01j *39/28*
U.S. Cl. 250—83.6 R **6 Claims**



A set of proportional counters has been arranged into an array which can detect and indicate the position of an X-ray interaction within the array, in the X–Y plane.

3,704,285

DISPERSION POLYMERIZATION OF TETRAFLUOROETHYLENE

Verleon Henry Porter, Parkersburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 812,294, Apr. 1, 1969. This application July 19, 1971, Ser. No. 163,877
Int. Cl. C08f *1/13, 3/24, 15/06*
U.S. Cl. 260—87.5 A **15 Claims**

A polymerization process for preparing an aqueous dispersion of polytetrafluoroethylene resins involving using both a hydrocarbon-based surfactant and a fluorocarbon-based surfactant as nucleators for polymerization followed by subsequent injection of chlorendic acid as stabilizer as the polymerization proceeds to normal final solids content. The resultant dispersion upon coagulation and drying yields products capable of being paste-extruded into tapes, etc., of a higher tensile strength for a given reduction ratio and extrusion pressure than previously attainable directly.

3,704,286

PRODUCTION OF UNSATURATED POLYMERIC HYDROCARBONS HAVING HIGH MOONEY VISCOSITIES

Johannes Schafer, Gerhard Berg, and Kurt Benedikter, Marl, Germany, assignors to Chemische Werke Huls, AG, Marl, Germany

Continuation of applications Ser. No. 513,622, July 30, 1965, and Ser. No. 804,372, Feb. 26, 1969. This application Dec. 29, 1969, Ser. No. 888,155
Claims priority, application Germany, July 30, 1964, P 14 95 370.9
Int. Cl. C08d *5/04, 5/02*
U.S. Cl. 260—94.7 R **9 Claims**

To increase the molecular weight of unsaturated polymeric hydrocarbons, such as butadiene, produced on the basis of Ziegler-type catalysts, after the termination of polymerization or the desired conversion has been reached, adding to the resultant reaction solution a compound of the formula RX wherein

R is a residue selected from the group consisting of halogeno, alkyl, cycloalkyl, aryl, aralkyl, acyl thionyl, sulfuryl, chromyl, vanadyl, phosphorus oxy, thiophosphorus, sulfonic acid, sulfinic acid, arsenic oxy, antimony oxy, titanyl, and imide, or a component selected from the group consisting of phosphorus, arsenic, sulfur, selenium, silicon, and tin, and

X represents at least one halogen atom.

3,704,287

HIGH TEMPERATURE REDUCED CATALYST AND PROCESS

Robert Norman Johnson, Basking Ridge, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,184
Int. Cl. C08f *1/42, 3/06*
U.S. Cl. 260—94.9 DA **59 Claims**

An improved catalyst useful for preparing high density olefin polymers in improved yields, and in some cases, with reduced swell properties, is prepared by depositing a chromate ester catalyst on activated silica and then treating the resulting composition with selected organo-metallic reducing agents at elevated temperatures.

3,704,288

L-TYROSYL-1-AMINOCYCLOPENTANE-1-CARBONYL-L-PHENYLALANINE

Joseph A. Skorcz, 5359 N. Bay Ridge Ave., Milwaukee, Wis. 53217

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,298
Int. Cl. C07c *103/52;* C07g *7/00*
U.S. Cl. 260—112.5 **1 Claim**

The compounds are novel peptides composed of an N-terminal-L-tyrosine moiety and a C-terminal-L-phenylalanine moiety joined by a 1-aminocyclopentane-1-carboxylic acid group or a 1-aminocyclohexane-1-carboxylic acid. The compounds are useful as hypotensive agents. Representative of the compounds disclosed are dicarbobenzoxy-L-tyrosyl-1-aminocyclopentane - 1 - carbonyl-L-phenylalanine methyl ester and L-tyrosyl-1-aminocyclopentane-1-carbonyl-L-phenylalanine.

3,704,289

INTERMEDIATES FOR MAKING LINCOMYCINS AND PROCESS FOR PREPARING THE SAME

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 867,362, Oct. 17, 1969. This application May 6, 1970, Ser. No. 35,255

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R 3 Claims

Lincomycin is formed by tosylating methyl 1-thio-α-D-galactooctopyranoside to form methyl 6-O-(p-toluenesulfonyl)-1-thio-α-D-galactopyranoside, acylating the resulting compound to form the peracylate, replacing the tosyl group with iodine to form peracylated methyl 6-deoxy-6-iodo - 1 - thio-α-D-galactopyranoside, replacing the iodo group by a nitro group to form peracylated methyl 6-deoxy-6-nitro-1-thio-α-D-galactopyranoside, treating the latter with acetaldehyde and sodium methoxide to form methyl 6 - deamino-6-nitro-α-thiolincosaminide, reducing the latter with lithium aluminum hydride to form methyl α-thiolincosaminide, and acylating the latter with trans-1-methyl-4-propyl-L-2-pyrrolidinecarboxylic acid. By substituting other aldehydes and/or other 1-thio-α-D-galactopyranosides, analogs of lincomycin are obtained.

3,704,290

6-(1 - SUBSTITUTED AMINOCYCLOALKANE-CARBOXAMIDO)-PENICILLANIC ACID AND SALTS

Joseph P. Hou and John W. Poole, Montgomery, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 37,911, May 15, 1970. This application Dec. 9, 1970, Ser. No. 96,653

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 7 Claims

Novel sulfonylated penicillins have been prepared which have antibacterial activity and are useful for the treatment of mastitis in cattle and for the treatment of infections caused by susceptible microorganisms.

3,704,291

PENICILLINS DERIVED FROM THE REACTION OF ENAMINES WITH 6-ISOCYANATO PENICILLANIC ACID

Milton Wolf, West Chester, James L. Diebold, Havertown, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 17, 1969, Ser. No. 886,021

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 3 Claims

Novel penicillanic acid derivatives possessing antibacterial activity have been prepared by the reaction of an enamine with 6-isocyanatopenicillanic acid trimethylsilyl ester.

3,704,292

SEMICARBAZIDOPENICILLINS

Milton Wolf, West Chester, James L. Diebold, Havertown, Peter B. Russell, Villanova, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Dec. 17, 1969, Ser. No. 885,999

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 8 Claims

Novel substituted semicarbazidopenicillanic acid derivatives have been prepared which are useful antibacterial agents.

3,704,293

5-METHYL-2-(STYRYLPHENYL)-4-TRIAZOLE-CARBOXAMIDE BRIGHTENERS

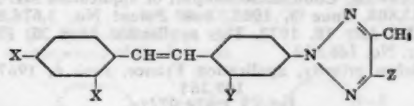
Albert F. Strobel and Maynard L. Whitehouse, Delmar, N.Y., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed June 17, 1970, Ser. No. 47,177

Int. Cl. C07d *55/02*

U.S. Cl. 260—240 C 13 Claims

A new class of brightening compounds having the formula:



wherein

one X represents hydrogen and the other X represents a lower alkoxy or a lower alkoxy which is substituted by the groups: $—CONH(CH_2)_{1-2}CH_2NRR_1$ and

$$—OCO(CH_2)_{1-2}CH_2NRR_1$$

in which R and R_1 represent hydrogen, lower alkyl, amine-substituted alkyl, cyclohexyl, benzyl and phenyl;

Y represents hydrogen, halogen, cyano, or a carboxamide or sulfonamide substituent, such as $CONR_2R_3$ or $SO_2NR_2R_3$; R_2 and R_3 represents hydrogen, lower alkyl, cyclohexyl, benzyl, phenyl, and when R_2 is lower alkyl it may be further substituted by $—CH_2NRR_1$;

Z is $—CONR_2R_3$; and

at least one of X, Y and Z must contain the grouping $—CH_2NRR_1$;

which compounds are particularly well suited for usage as fluorescent brightening agents in connection with fibrous foils and molds of polyacrylonitrile and related products.

3,704,294

PROCESS FOR PREPARING 6-AMINO-PENICILLANIC ACID COMPOUNDS

Yukichi Kishida, Nobuo Soma, Junichi Nakazawa, Yoshio Sato, Hidebumi Matsuda, Atsusuke Terada, Taiichiro Watanabe, Yukio Sugimura, Toshihide Miyamura, and Masanao Kaneko, Tokyo, Japan, and Mitsuo Watatani, deceased, late of Tokyo, Japan, by Takako Watatani, heiress, Yokohama, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed Mar. 19, 1970, Ser. No. 21,180

Claims priority, application Japan, Mar. 25, 1969, 44/22,553; Mar. 29, 1969, 44/24,207

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 10 Claims

Improved production of a 3-phenyl-5-methyl-4-isoxazolylpenicillin compound, useful as antibacterial agents, is effected by reacting a 1-tetrolylcycloheptaimidazol-2(1H)-one with a benzonitrile N-oxide compound to form a 1-[3-phenyl - 5 - methylisoxazole - 4 - carbonyl]cycloheptimidazol-2(1H)-one compound and then reacting said compound with 6-aminopencillanic acid.

3,704,295

STEROIDO[3,2-c]PYRAZOLES AND PREPARATION THEREOF

Raymond O. Clinton, East Greenbush Township, Rensselaer County, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 723,148, Mar. 24, 1958. This application Feb. 16, 1959, Ser. No. 793,292

Int. Cl. C07c *173/10*

U.S. Cl. 260—239.5 24 Claims

This invention relates to heterocyclic substituted steroids, and in particular it is concerned with steroido

[3,2-c]pyrazoles and the preparation thereof, and to intermediates in the preparation thereof.

3,704,296

SUBSTITUTED THIAZOLIDINE-4-ONES

Max J. Mousseron, Montpellier, France, assignor to Etablissements Clin-Byla, Paris, France

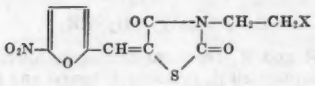
No Drawing. Continuation-in-part of application Ser. No. 733,808, June 3, 1968, now Patent No. 3,678,041, dated July 18, 1972. This application May 25, 1971, Ser. No. 146,832

Claims priority, application France, June 6, 1967, 109,263

Int. Cl. C07d *91/14*

U.S. Cl. 260—240 A **3 Claims**

Highly active antibacterials are described which are 5-substituted thiazolidine-4-ones having formula



in which X is Cl or Br. Tests are described in which activity against a large number of gram positive and gram negative bacteria are reported.

3,704,297

7 - (1,4 - CYCLOHEXADIENYLACYLAMIDO)CEPHALOSPORANIC ACIDS AND RELATED COMPOUNDS

William Dvonch, Radnor, and Harvey E. Alburn, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 23,099, Apr. 6, 1970, which is a continuation-in-part of application Ser. No. 843,801, July 22, 1969, both now abandoned. This application Mar. 5, 1971, Ser. No. 121,592

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **5 Claims**

This invention concerns 7-(1,4-cyclohexadienylacylamido)cephalosporanic acids, related compounds and the salts thereof which have potent antibiotic activity particularly against penicillin resistant staphylococci.

3,704,298

4-ACYLOXY-3-(2-ISOXAZOLOCARBAMYL)-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDES

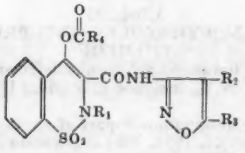
Harold Zinnes, Rockaway, Martin L. Schwartz, Gillette, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

No Drawing. Filed June 22, 1971, Ser. No. 155,605

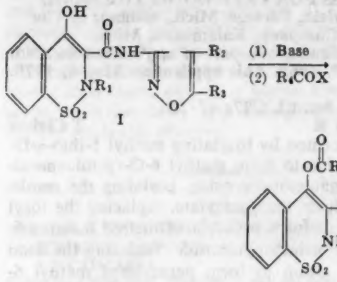
Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **1 Claim**

Compounds of the formula



are disclosed, wherein R_1 is alkyl; R_2 and R_3 are hydrogen or alkyl and R_4 is alkyl, aryl, aralkyl, heterocyclic or alicyclic. They are prepared in accordance with the following reaction scheme:



These compounds are useful as anti-inflammatory agents, antipyretics and analgesics.

3,704,299

5-OXOMORPHOLINYL-2,1-BENZISOTHIAZOLINES

Joseph A. Skorcz, 5359 N. Bay Ridge Ave., Milwaukee, Wis. 53217; and John T. Suh, 3709 W. Scenic Drive; and Claude I. Judd, 10904 N. Crestline Road, 39–W, both of Mequon, Wis. 53092

No Drawing. Continuation-in-part of application Ser. No. 798,119, Feb. 10, 1969. This application July 14, 1971, Ser. No. 162,641

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 **5 Claims**

The compounds are 5 - oxomorpholinyl - 2,1 - benzisothiazoline-2,2-dioxides useful as central nervous system depressants. The compounds are also useful as intermediates in the preparation of the corresponding 5-morpholinyl-2,1-benzisothiazolines. A compound disclosed is 1-methyl - 5 - (4 - benzyl - 5 - oxo - 2 - morpholinyl)-2,1-benzisothiazoline-2,2-dioxide.

3,704,300

IMIDAZO(2,1-a)PHTHALAZINES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 785,765, Dec. 20, 1968. This application Apr. 9, 1971, Ser. No. 132,869

Int. Cl. C07d *51/06*

U.S. Cl. 260—250 A **14 Claims**

This invention discloses novel compounds which are imidazo(2,1-a)phthalazines and methods of preparation, said imidazo(2,1-a)phthalazines being useful by reason of exhibiting pharmacological activity in animals, e.g., as hypotensives.

3,704,301

4-(5-NITROFURYL)PYRIMIDINES

Herbert Berger, Mannheim-Kafertal, Rudi Gall, Grossachsen, Hartmut Merdes, Heidelberg, Kurt Stach, Mannheim-Waldhof, Wolfgang Voemel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

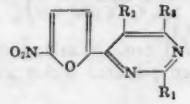
No Drawing. Filed June 4, 1969, Ser. No. 830,489

Claims priority, application Germany, July 9, 1968, P 17 70 831.5

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 R **6 Claims**

5-nitrofuran derivatives and the physiologically acceptable salts thereof having the formula:



wherein R_1 and R_2 are each hydrogen, lower alkyl, alkoxy, amino or acylamino and R_3 is hydrogen, hydroxyl, lower alkoxy, amino or acylamino are characterized by marked antimicrobial activity and have been found to be particularly effective in the treatment of urinary tract infections.

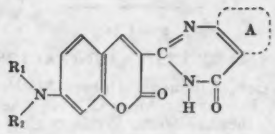
3,704,302

CERTAIN CUMARIN QUINAZOLINONES

Sigeharu Enomoto, Hyogo, Katsunobu Sato, Osaka, and Goichi Suzuki, Hyogo, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,296
Claims priority, application Japan, Apr. 18, 1969, 44/30,600; Aug. 22, 1969, 44/66,793; Oct. 4, 1969, 44/79,295; Nov. 13, 1969, 44/91,217; Dec. 27, 1969, 45/1,868
Int. Cl. C07d *99/04*
U.S. Cl. 260—256.4 Q 6 Claims

Compounds of the formula



wherein R_1 and R_2 each represent a hydrogen atom or a substituted or unsubstituted alkyl or a cycloalkyl group, or R_1 and R_2 can form a heterocyclic ring together with the nitrogen atom attached to the cumarin residue, and ring A represents a substituted or unsubstituted benzene ring or a naphthalene ring are disclosed. They can be employed for dyeing hydrophobic fibers a clear yellow tone with good fastnesses.

3,704,303

6,7,8,9 - TETRAHYDROPYRIMIDO[2,1-b] - BENZOTHIAZOLE-6-CARBOXYLIC ACID, ALKYL ESTERS

Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,375
Int. Cl. C07d *99/10*
U.S. Cl. 260—256.5 R 1 Claim

A novel series of compounds is described which are pharmacologically active as antiinflammatory agents. The compounds are characterized as the lower alkyl esters of 6,7,8,9-tetrahydropyrimido[2,1-b]-benzothiazole - 6 - carboxylic acid.

3,704,304

5(7)-ACETAMID O-3-(SUBSTITUTEDPHENYL)-2,3-DIHYDRO - 3-HYDROXY-7(5)H-THIAZOLO(3,2-ALPHA)PYRIMIDINE - 2 - ALKANOIC ACID, ALKYL ESTERS

Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 17, 1971, Ser. No. 125,376
Int. Cl. C07d *99/10*
U.S. Cl. 260—256.5 R 2 Claims

A novel series of compounds are described which are biologically active as inhibitors of *Mycobacterium tuberculosis*. The compounds are characterized as (5(7)-acetamido - 3 - (substitutedphenyl) - 2,3 - dihydro - 3 - hydroxy - 7(5) - oxo - 7(5)H - thiazolo[3,2 - a]pyrimidine-2-alkanoic acid, alkyl esters.

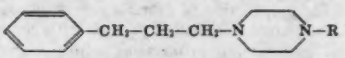
3,704,305

N-(γ-PHENYLPROPYL)-N'-(SUBSTITUTED)-PIPERAZINES

Claude P. Fauran, Michel J. Turin, and Guy M. Raynaud, Paris, and Bernard M. Pourrias, Meudon, France, assignors to Delalande S.A., Courbevoie (Hauts-de-Seine), France

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,483
Claims priority, application Great Britain, Sept. 4, 1968, 41,965/68
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 R 3 Claims

A compound of the formula



wherein R is alkoxy carbonylalkyl, cyanoalkyl, or hydroxyalkyl substituted by phenyl or phenyl substituted by alkoxy.

The compounds are prepared by reacting 1-bromo-3-phenylpropane with piperazine substituted with R. The compounds possess hypotensive, vasodilatory, adrenolytic, spasmolytic and diuretic properties.

3,704,306

ADAMANTANE-1,3-DICARBOXYLIC ACID ESTERS

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 631,181, Apr. 17, 1967. This application Jan. 26, 1970, Ser. No. 5,989
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 PA 8 Claims

Dialkylaminoalkyl and related esters of adamantane-1,3-dicarboxylic acid and adamantane-1,3-diacetic acid are described. They are useful as antifungal and anti-viral agents. The compounds are prepared by the reaction of the approproate dicarboxylic acid with a dialkylaminoalkyl halide or they can be prepared by the reaction of the appropriate dicarboxylic acid halide with a dialkylaminoalkanol or similar compound.

3,704,307

PROCESS FOR THE PREPARATION OF 3-CHLORO-4-METHOXY-PHENYLISOCYANATE

Wilfried Zecher, Cologne, Engelbert Kuhle, Bergisch Gladbach, and Hans Holtschmidt, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 5, 1969, Ser. No. 882,747
Claims priority, application Germany, Dec. 12, 1968, P 18 14 251.3
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 P 10 Claims

Chlorinating 4-methoxy-phenylisocyanate with a chlorinating agent, e.g. elementary chlorine, at a temperature of about —10 to 140° C., optionally in the presence of an inert solvent, e.g. a chlorinated hydrocarbon or thionyl chloride, to form the known 3-chloro-4-methoxy-phenylisocyanate which is a valuable intermediate for the production of herbicides.

3,704,308

BORON-CONTAINING HIGH MOLECULAR WEIGHT MANNICH CONDENSATION

Edmund J. Piasek, Chicago, Ill., and Robert E. Karll, Munster, Ind., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 502,368, Oct. 22, 1965. This application Apr. 14, 1969, Ser. No. 816,125
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R 5 Claims

Oil-soluble boron-containing derivatives of Products of Mannich condensation from reactants (1) a high molecu-

lar weight alkyl-substituted hydroxyaromatic compound whose alkyl substituent has upward from 40 to 20,000 carbon atoms, (2) a lower alkyl-substituted phenol whose alkyl group has 2 to 20 carbon atoms, (3) an amine which contains an HN< group, and (4) an aldehyde in the respective molar ratio of 1.0:0–7:0.1–10:1.0–10 wherein the boron content expressed as a boron to nitrogen weight ratio (B/N) is in the range of 0.15–5:1.0. The boron derivatives as solutes in weight concentrations of 0.05 to 70 percent dissolved in mineral oil of the lubricating oil types are useful as crankcase lubricating compositions, concentrates for fortifying used crankcase lubricating composition and for preparation of crankcase lubricating compositions. Those boron derivatives provide detergency, dispersancy and anti-oxidant properties to lubricating oils.

3,704,309

METHOD OF PREPARATION OF SUBSTITUTED DIARYL OXALATES

Donald Roy Maulding, Branchburg Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 27, 1971, Ser. No. 110,295

Int. Cl. C07c *69/36*

U.S. Cl. 260—479 S **8 Claims**

Method for producing diaryl oxalates by reaction of tetrachloroethylene carbonate and substituted phenols. The aryl oxylate compounds obtain chemiluminescent light when reacted with other necessary chemiluminescent reactants in the direct generation of light from chemical energy. By "light" as referred to herein is meant electromagnetic radiation at wavelength falling between about 350 mμ and about 1,000 mμ.

3,704,310

CHLORAL COMPOUNDS

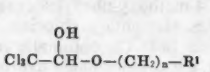
Adolf Fischer, Mutterstadt, Friedrich Becke, Heidelberg, and Reinhold Kohlhaupt, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Original application May 14, 1969, Ser. No. 824,661. Divided and this application Jan. 6, 1971, Ser. No. 104,493

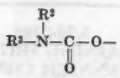
Int. Cl. C07c *125/06*

U.S. Cl. 260—482 C **2 Claims**

New and valuable chloral compounds having the formula:



in which R^1 denotes the radical



n denoting one of the integers from 1 to 6, R^2 denotes hydrogen or a lower alkyl radical or alkenyl radical and R^3 denotes hydrogen or the trichloroethylol radical

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3,704,311

FUNCTIONAL BIS(PERFLUOROALKYLSULFONYL)ALKYL COMPOUNDS

Robert J. Koshar, Lincoln Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Mar. 14, 1969, Ser. No. 807,408

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 H **3 Claims**

Bis(perfluoroalkanesulfonyl)substituted methanes possessing reactible groups such as halogen, hydroxyl, carboxyl or ester groups or possessing carbon-to-carbon unsaturation are provided. The residual hydrogen of the methane is relatively acidic and the compounds form metallic and organic salts which are recoverable. The molecule with acid hydrogen can be further reacted by the reactible group to incorporate an acidic hydrogen in another molecule such as a polymer. The acidic hydrogen effects absorption of basic vapors such as ammonia, amines, etc. Bis(perfluoroalkylsulfonyl) bromomethanes add to olefinic double bonds.

3,704,312

BIALICYCLIC AMINO ACIDS

Peter B. Russell, Villanova, Horace Fletcher III, Pottstown, and Harvey E. Alburn, West Chester, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,748

Int. Cl. C07c *101/04*

U.S. Cl. 260—514 R **12 Claims**

The compounds are bialicyclic amino acids which are useful as anti-inflammatory agents in warmblooded animals. The compounds are also useful, when their amino groups are properly blocked, for reacting with 6-aminopenicillanic acid, or derivatives thereof, to prepare penicillins having antibiotic activity, or as intermediates in the preparation of their corresponding N-carboxyanhydrides which may be reacted directly with 6-aminopenicillanic acid, or derivatives thereof, to prepare said penicillins.

3,704,313

p-CYCLOHEXYLPHENYLGLYCOLIC ACID AND DERIVATIVES THEREOF

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer Inc., Washington, Pa.

Filed Oct. 10, 1968, Ser. No. 767,058

Int. Cl. C07c *65/14*

U.S. Cl. 260—520 **6 Claims**

The compounds of this invention are non-steroids. When administered to mammals, they afford significant inhibition in the development of inflammation from polyarthritis and manifest significant analgesic and antipyretic activities in the treated mammal.

3,704,314

(1-OXO-2-ALKYLIDENEINDANYLOXY) AND (1-OXO - 2 - ALKYLIDENEINDANYLTHIO) ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,840

Int. Cl. C07c *69/26*

U.S. Cl. 260—520 **11 Claims**

(1 - oxo - 2-alkylideneindanyloxy) and (1-oxo-2-alkylideneindanylthio)alkanoic acid products and salts, esters

and amide derivatives thereof wherein the 1-oxo-2-alkylideneindanyl ring may be substituted by various radicals are disclosed. The products may be prepared by four routes: (1) via the dehydrohalogenation of a [1-oxo-2-halo-2-alkylindanyloxy (or thio)]alkanoic acid; (2) via the hydrolysis of a [1-oxo-2-alkylideneindanyloxy (or thio)]alkanoic acid ester; (3) via the etherification of a hydroxy (or mercapto)-2-alkylidene-1-indanone, or (4) when the alkylidene moiety is methylene, via the Mannich reaction by treating a [1-oxoindanyloxy (or thio)] alkanoic acid with a salt of a secondary amine in the presence of formaldehyde or paraformaldehyde followed by treatment of the Mannich intermediate with a weak base. The products thus obtained are diuretics and saluretics useful in the treatment of edema and hypertension.

3,704,315

DIALKYLSALICYLIC ACIDS AND ALKALINE EARTH METAL SALTS THEREOF

Aart Strang, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Dec. 17, 1969, Ser. No. 885,982
Claims priority, application Great Britain, Dec. 19, 1968, 60,355/68
Int. Cl. C07c *65/12*
U.S. Cl. 260—521 R **4 Claims**

Alkylsalicylic acids having a high degree of para-substitution and having the alkyl group attached to the benzene nucleus by a quaternary carbon atom are prepared from tertiary alkylating agents and in particular by a two stage alkylation of phenol using a straight chain monoolefin in the first stage and a branched monoolefin in the second stage. The polyvalent metal salts of said acids are excellent lubricant and fuel additives characterized by improved high temperature performance, the ability to keep the interior of engine cylinders clean and to counteract deposition of carbonaceous matter on pistons and piston ring grooves.

3,704,316

PREPARATION OF AMINO ACIDS BY HYDROLYSIS OF BACTERIAL CELLS OBTAINED BY FERMENTATION

Takemi Hanaoka, Toshiro Kakehashi, and Ryota Toyomasu, Saga-shi, and Tomio Yata, Yokohama-shi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Jan. 13, 1970, Ser. No. 2,679
Int. Cl. C07c *99/02*
U.S. Cl. 260—527 N **3 Claims**

When bacterial cells obtained in the production of amino acids by a fermentation process are hydrolyzed with hydrochloric acid, humins are formed and have to be removed by filtration when other constituents of the cells are to be recovered. The filtration time is sharply reduced if the hydrolysis is carried out in the presence of an oxidizing agent.

3,704,317

PRODUCTION OF ACETIC ACID

Takashi Yamashita, Yugo Chida, Sadayoshi Ninagawa, and Tetsuya Kato, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Apr. 11, 1969, Ser. No. 816,060
Claims priority, application Japan, Apr. 26, 1968, 43/28,080
Int. Cl. C07c *53/08, 51/32*
U.S. Cl. 260—533 R **14 Claims**

Acetic acid is formed in high yield from iso-butene as well as from n-butene by gas phase oxidation using a vanadium catalyst containing one or more of the secondary elements Li, B, Si, Cr, Fe, Ni, Zn, Zr, Nb, Ru, Rh, Ta and Bi.

3,704,318

PROCESS FOR THE PRODUCTION OF N-CARBAMIDES OF AMINO ACIDS CONTAINING THIOL GROUPS

Adolf F. Stark, Munich, Allach, and Winfried Kolbeck and Friedrich J. Bayerlein, Munich, Germany, assignors to Diamalt Aktiengesellschaft, Munich, Germany

No Drawing. Filed June 29, 1966, Ser. No. 561,385
Int. Cl. C07c *149/24*
U.S. Cl. 260—534 S **6 Claims**

The process for the preparation of N-carbamides of thiol amino acids by reacting the amino acid with salts of cyanic acid in a basic medium.

3,704,319

PRODUCTION OF CARBOXYLIC ACIDS

Paul H. Washecheck and Charles M. Stark, Ponca City, Okla., and Clyde E. Bishop, Indianapolis, Ind., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,796
Int. Cl. C07c *51/24*
U.S. Cl. 260—540 **9 Claims**

Straight chain ester compounds derived from alcohols and organic acids are oxidized by contact with nitric acid at a temperature of from about 40° C. to about 110° C. to yield straight chain carboxylic acids. At relatively high temperatures within the operative temperature range, good yields of carboxylic acids containing 1 less carbon atom than the alcohol moiety of the ester starting material are realized. As the temperature at which the nitric acid oxidation is carried out is decreased, the distribution of the carboxylic acid products derived from the alcohol moiety of the ester shifts to favor the production of carboxylic acids containing the same number of carbon atoms as contained by the alcohol moiety of the ester.

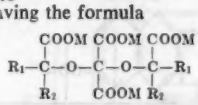
3,704,320

DETERGENT FORMULATIONS

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 30, 1971, Ser. No. 158,602
Int. Cl. C11d *1/38, 1/12*
U.S. Cl. 252—546 **6 Claims**

Compounds having the formula



wherein M is an alkali metal or ammonium and R_1 and R_2 are hydrogen or methyl in combination with surfactants provide effective detergent formulations.

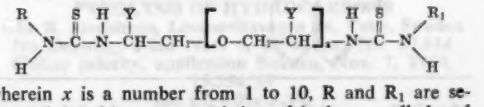
3,704,321

POLYOXYALKYLENE BIS-THIOUREA EXTREME PRESSURE AGENTS AND METHODS OF USE

Thomas J. Kmet, Midlothian, and Jon A. Loboda, Chicago, Ill., assignors to The Richardson Company, Melrose Park, Ill.

No Drawing. Filed May 24, 1971, Ser. No. 146,535
Int. Cl. C07c *157/00*
U.S. Cl. 260—552 R **6 Claims**

Novel substituted and unsubstituted polyoxyalkylene bis-thioureas having the formula:



wherein x is a number from 1 to 10, R and R_1 are selected from the group consisting of hydrogen, alkyl and alkenyl, Y is hydrogen or lower alkyl, are useful as extreme pressure lubricants in metal working fluids and

particularly in aqueous type fluids. Compositions comprising the thioureas and a boundary lubricant provide the anti-weld and friction reduction properties necessary for heavy duty machining.

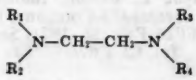
3,704,322

N-ALKYL-N'-(1-NAPHTHOYL) ETHYLENE DIAMINES

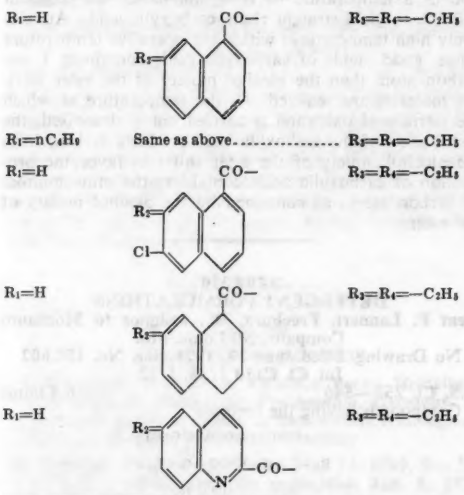
Mario Giannini, Florence, Italy, assignor to Malesci S.A.S. Istituto Farmacobiologico, Florence, Italy

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,475
Claims priority, application Italy, Sept. 24, 1969, 40,263/69
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 R **1 Claim**

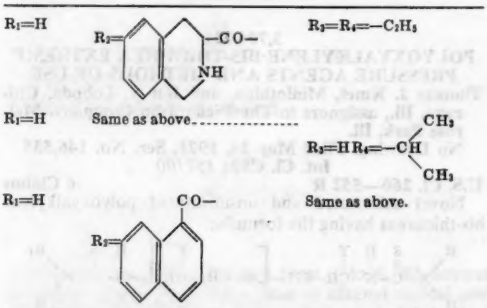
Process for preparing ethylene diamine derivatives of the general formula:



where:



wherein the chlorides of the corresponding acids are reacted with the appropriate amine in anhydrous benzene, or where:



wherein the α-naphthoic acid ethyl ester and 1:2:3:4-tetraisoquinolyl-3-carboxylic acid ethyl ester are reacted with the appropriate amine in the absence of solvent.

3,704,323

INDANE DERIVATIVES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Continuation-in-part of application Ser. No. 566,729, Sept. 26, 1969. This application Dec. 23, 1969, Ser. No. 887,723
Int. Cl. C07c *87/64*
U.S. Cl. 260—576 **5 Claims**

2-methyl-2-phenylindanamines are described. The compounds possess central nervous system stimulant activity.

3,704,324

PROCESSES FOR THE PREPARATION OF DESA-ANDROSTANES, PREGNANES, AND UNSATURATED DERIVATIVES THEREOF

Milan Radoje Uskokovic, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application Oct. 20, 1965, Ser. No. 499,094, now Patent No. 3,574,761, which is a continuation-in-part of application Ser. No. 400,206, Sept. 29, 1964. Divided and this application June 17, 1968, Ser. No. 737,361
Int. Cl. C07c *49/00*
U.S. Cl. 260—586 H **12 Claims**

This invention is directed to processes for the preparation of desA-androstanes, pregnanes and unsaturated derivatives thereof by pyrolyzing the alkali metal salt of the corresponding 3,5-seco-3-oic acid. The intermediates prepared in accordance with the process of this invention enable the preparation of 9β,10α-steroids which are pharmacologically useful as anabolic, anti-androgenic, progestational and salt-retaining agents.

3,704,325

PROCESS FOR TRIS (HYDROXYMETHYL) PHOSPHINE BY USE OF HIGH BOILING SOLVENT

Richard Frederick Stockel and William Frank Herbes, Bridgewater Township, Somerset County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Nov. 27, 1970, Ser. No. 93,404
Int. Cl. C07f *9/50*
U.S. Cl. 260—606.5 P **3 Claims**

Production of tris(hydroxymethyl)phosphine of high purity and relatively free of water. Phosphine is reacted with about three moles of formaldehyde in the presence of a high boiling organic solvent at elevated temperatures and pressures.

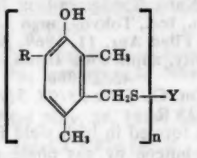
3,704,326

HYDROCARBON-BRIDGED THIOMETHYLENE-PHENOL ANTIOXIDANTS

John Song, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

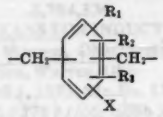
No Drawing. Filed Jan. 22, 1970, Ser. No. 5,130
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F **12 Claims**

Hydrocarbon-bridged thiomethylenephenols are provided having the formula



in which R is a branched-chain alkyl of 3 to 12 carbon atoms, Y is a divalent or trivalent alkylene of 2 to about

20 carbon atoms or a mononuclear aromatic radical of the formula



wherein R_1, R_2, and R_3 are hydrogen or alkyl of 1–3 carbon atoms and X is R_1 or $—CH_2—$, and *n* is 2 or 3. They are antioxidants for oxygen-sensitive organic materials, particularly polyolefins of 2–6 carbon atoms such as polypropylene plastics. They are prepared by condensing two or three moles of a 3-chloromethyl-2,4-dimethyl-6-branched chain alkylphenol with a hydrocarbon dithiol or trithiol or by condensing the corresponding 3-mercaptomethyl phenol with a hydrocarbon having two or three active chloromethyl groups.

3,704,327

ALKYLIDENEDITHIO-BISPHENOLS

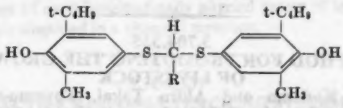
Martin B. Neuworth, Trumbull, Conn., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Continuation-in-part of application Ser. No. 835,811, June 23, 1969, which is a continuation-in-part of applications Ser. No. 637,622, Ser. No. 637,649, and Ser. No. 637,650, all May 11, 1967, all now abandoned. This application Dec. 10, 1971, Ser. No. 206,930

Int. Cl. C07c *149/18*

U.S. Cl. 260—609 F **2 Claims**

Alkylidenedithiobisphenols having the general formula:



where R is hydrogen or methyl. The compounds are useful as rubber antioxidants.

3,704,328

4- AND 5-ARYL-1-NAPHTHALENEETHANOL COMPOUNDS

James S. Kaltenbronn, 3555 Greenbrier Drive, Apt. 70C, Ann Arbor, Mich. 48105, and Franklin W. Short, 3431 Clover Drive, Saline, Mich. 48176

No Drawing. Continuation-in-part of application Ser. No. 573,871, Aug. 22, 1966. This application Jan. 21, 1970, Ser. No. 4,744

Int. Cl. C07c *31/14*; A61k *27/00*

U.S. Cl. 260—618 F **4 Claims**

4-phenyl- and 5-phenyl-1-naphthaleneethanols, optionally substituted by o- or m-halo or by β-methyl. The compounds have pharmacological activity and can be produced by (a) reducing a carboxylic acid, salt, or ester, (b) reacting a 1-naphthylmagnesium halide with ethylene oxide and hydrolyzing the product or (c) reacting a 1-naphthylmethylmagnesium halide with formaldehyde and hydrolyzing the product.

3,704,329

CATALYTIC HYDRATION OF OLEFINS TO ALCOHOLS

Ermbrecht Rindtorff, Recklinghausen, and Wilhelm Ester, Herne, Westfalen, Germany, assignors to Veba-Chemie Aktiengesellschaft

No Drawing. Continuation-in-part of application Ser. No. 174,396, Feb. 20, 1962. This application Sept. 27, 1966, Ser. No. 582,245

Claims priority, application Germany, Feb. 21, 1961, B 61,372, Patent 1,156,772

Int. Cl. C07c *29/04*; B01j *11/82*

U.S. Cl. 260—641 **5 Claims**

Catalytic hydration of olefins to alcohols at elevated temperatures and pressures with water in gaseous phase in the presence of a mineral catalyst prepared by impregnating a porous mineral alumina-silicate, e.g. bentonite, having an Al_2O_3 content below about 10% by weight with phosphoric acid.

3,704,330

PROCESS FOR RECOVERY OF PARA-XYLENE FROM MIXTURES OF META AND PARA-XYLENE

Mohamed M. El-Mogazi, Hightstown, and Charanjit Rai, Somerset, N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Nov. 26, 1968, Ser. No. 779,215

Int. Cl. C07c *7/14*

U.S. Cl. 260—674 A **5 Claims**

In the separation of para-xylene from mixtures consisting predominantly of meta- and para-xylene isomers by fractional crystallization, small amounts of organometallic eutectic inhibitors are dissolved in the xylene mixture to lower the eutectic point of the mixture and improve recovery of para-xylene therefrom. The amount of organometallic compound dissolved in the xylene mixture is between about 0.01 and about 4.0 mole percent and is preferably in the range between about 0.3 and about 1.0 mole percent.

3,704,331

PROCESS FOR THE PRODUCTION OF ANTHRACENE

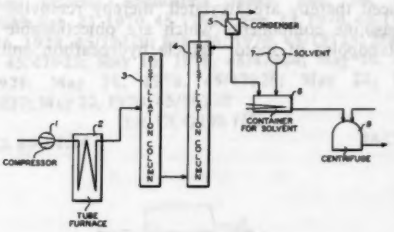
Herbert Buffleb, Castrop-Rauxel, and Heinz-Gerhard Franck, Duisburg-Meiderich, Germany, and Johannes Turowski, deceased, late of Castrop-Rauxel, Germany, by Else Paula Maria Turowski, nee Hinz, heir, Castrop-Rauxel, Gerd Collin, Duisburg-Meiderich, and Maximilian Zander, Castrop-Rauxel, Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 15, 1970, Ser. No. 98,426

Claims priority, application Germany, Jan. 7, 1970, P 20 00 351.4

Int. Cl. C07c *15/28, 15/30*

U.S. Cl. 260—675 **5 Claims**



Oils rich in aromatic substances or residues from the pyrolysis of gasoline or similar hydrocarbon mixtures are used for the production of anthracene through enrichment by distillation and recrystallization from an aryl-alkyl-ketone, preferably acetophenone.

3,704,332

PYROLYSIS OF HYDROCARBONS

Olle B. Lindstrom, Lorensviksvagen 14, Taby, Sweden

No Drawing. Filed Nov. 6, 1970, Ser. No. 87,614

Claims priority, application Sweden, Nov. 7, 1969, 15,354/69

Int. Cl. C07c *3/00*

U.S. Cl. 260—679 R **3 Claims**

A process for the production of acetylene and ethylene by pyrolysis of liquid hydrocarbons heated in a flame with

improved yields being obtained through the use of a knallgas flame and the introduction of the hydrocarbons in a finely divided or droplet form.

3,704,333

THERMAL DECOMPOSITION OF ORGANIC COMPOUNDS

Carl D. Spangler, Jr., Frederick J. Radd, and Louis H. Wolfe, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Aug. 20, 1970, Ser. No. 65,665
Int. Cl. C07c *5/22*
U.S. Cl. 260—683 **6 Claims**

The present invention relates to an improved process for thermally decomposing organic compounds in contact with alloy steel, e.g., the cracking of low molecular weight hydrocarbons in heat-resistant alloy steel furnace tubes to produce olefins or acetylenes. By the present invention, heat-resistant alloy steel comprised of at least 1% by weight silicon is employed, and a carburization-resistant protective film comprised of silicon oxidation compounds is formed thereon. The protective film is formed by pretreatment of the alloy with steam prior to thermally decomposing the organic compound therein and/or by combining a small amount of steam with the organic compound so that the protective film is formed during the thermal decomposition.

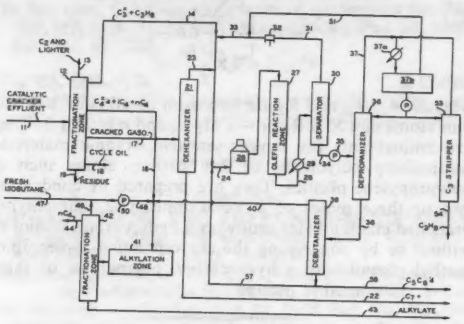
3,704,334

HYDROCARBON CONVERSION

Rolland E. Dixon and Fred E. Sherk, Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation-in-part of application Ser. No. 683,354, Nov. 15, 1967. This application Mar. 2, 1970, Ser. No. 15,347
Int. Cl. C07c *3/00, 3/50*
U.S. Cl. 260—683.43 **6 Claims**

Pentene and/or hexene are converted by the olefin reaction to produce butene. In one embodiment C_5 and/or C_6 olefins are separated from a gasoline stream, converted according to the olefin reaction, and lighter olefins produced thereby are alkylated, thereby removing from the gasoline components which are objectionable from the standpoint of motor vehicle hydrocarbon emissions and producing high octane lower volatility components which reduce or eliminate the need for lead-containing



antiknock additive and reduce olefinic hydrocarbon emission due to vaporization loss.

ERRATA

For Classes 423—128 thru 423—242 see:
Patents Nos. 3,704,091 thru 3,704,095

ERRATUM

For Class 423—342 see:
Patent No. 3,704,104

3,704,335

METHOD FOR PROMOTING THE GROWTH OF LIVESTOCK

Yutaka Kodama and Akira Takai, Toyama-shi, and Tatsumi Inagaki, Tokyo, Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

No Drawing. Filed July 25, 1969, Ser. No. 845,053
Int. Cl. A61k *27/00*
U.S. Cl. 424—249 **4 Claims**

3-di(hydroxymethyl)amino - 6-(5-nitro - 2-furylethenyl)-1,2,4-triazine is very effective for promoting the growth of livestock (for example, poultry, ducks, turkeys, swine, horses, cattle and goats) when given to the livestock in combination with carriers such as feeds and inert minerals.

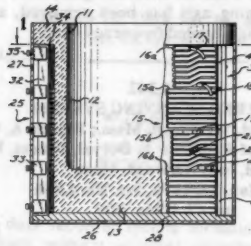
ELECTRICAL

3,704,336

SUPPORT MEANS FOR INDUCTION COIL

Don A. Synnestvedt, Warren, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed April 1, 1971, Ser. No. 130,240
Int. Cl. F27d *11/06*; H05b *5/16*
U.S. Cl. 13—27 **13 Claims**



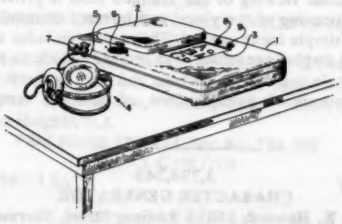
There is disclosed herein longitudinal outer coil support means for a multisection induction coil, the coil comprising both cooling and power coil sections each including a number of coil turns. The coil turns carry fastening devices at spaced portions of the periphery, the fastening means being aligned longitudinally of the multisection induction coil and projecting through longitudinally aligned, insulating sections. The outer edges of each longitudinally aligned group of insulating sections are disposed in a channel member.

3,704,337

TACTILE RESPONSE TEACHING SYSTEM

John C. Sims, Jr., Sudbury, and Lloyd D. Brace, Jr., Concord, both of Mass., assignors to Information Transfer Corporation, Wellesley, Mass.

Filed April 7, 1969, Ser. No. 813,930
Int. Cl. G09b *7/04*
U.S. Cl. 35—9 R **15 Claims**



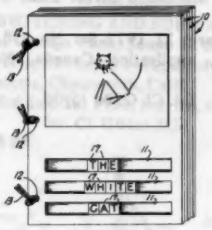
A teaching system for supplying visual and audible teaching information to a student in a teaching sequence determined by the tactile response of the student to the audible information, comprising a machine actuable to sequentially feed a sequence of cards from a supply station to a viewing station and then back to the supply station. The cards bear printed visible choice fields on one side, and, on the opposite side, printed circuits and recorded audible sound tracks. There is a platen on the machine adapted to cooperate with printed circuits on a card in viewing position. Interposed between the card and the platen is a compressible mask operable by a student's finger touching a choice point on the choice field to deform and permit a connection between a selected choice point on the card and the platen. There is programmable apparatus in the machine for reproducing audible tracks on a card in viewing position in a sequence determined by a program established by the printed circuits on the card in position.

3,704,338

BOOK FOR TEACHING READING

Robert Eugene Shore, Box 296, Kentfield, Calif.

Filed Nov. 13, 1970, Ser. No. 89,194
Int. Cl. G09b *17/00*
U.S. Cl. 35—35 E **1 Claim**



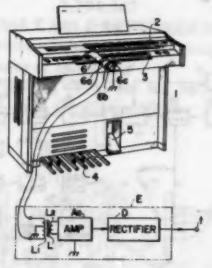
An educational device and method for the individualized teaching of reading employing a series of page panels each including elongated word-well slots. Pieces depicting letters are placed into the slots to form words and sentences corresponding to a learner's own speech and mental image of the story idea. The learner illustrates his talk placed in the slots by drawing on a disposable sheet mounted onto each panel. When the child expresses a sequence of mental images, one per panel, the panels are inked to form a book depicting an original story. The child then masters his own speech forms (talk) at the reading level. In learning to read his own speech he can more easily read what others have written.

3,704,339

MUSCULAR VOLTAGE-CONTROLLED TONE-MODIFYING DEVICE

Naoyuki Nilnomi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Feb. 17, 1971, Ser. No. 115,981
Claims priority, application Japan, Feb. 18, 1970, 45/14049; Feb. 23, 1970, 45/17670; Feb. 23, 1970, 45/17671; Feb. 26, 1970, 45/19120; Feb. 26, 1970, 45/19121; May 16, 1970, 45/47923; May 16, 1970, 45/47924; May 16, 1970, 45/47925; May 16, 1970, 45/47926; May 22, 1970, 45/50227; May 22, 1970, 45/50228
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 **28 Claims**



An electronic musical instrument is controlled also by the muscular voltage of the instrument player. A pair of electrodes are mounted on any selected portion of the skin of the player in order to pick up a muscular voltage appearing across

a muscle upon a contraction thereof. The picked-up voltage is amplified and processed into a control signal which in turn controls the tone signal modifying circuit in the instrument. While the player is engaged in the ordinary performance using hands and feet, further effect control can be carried out at the player's will.

3,704,340

RHYTHM TRAPS

Jack G. Hall, 15 Mississaga Street East, Orillia, Ontario, Canada

Filed March 27, 1972, Ser. No. 238,546

Claims priority, application Canada, Nov. 30, 1971, 128,957

Int. Cl. G10d *15/00*

U.S. Cl. 84—170 **10 Claims**

A rhythm device comprising two resiliently interconnected shafts capable of relative movement between two positions. Noise-making means such as cymbals are mounted on each shaft such that sound is produced at one of the two aforesaid positions.

3,704,341

COLOR VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

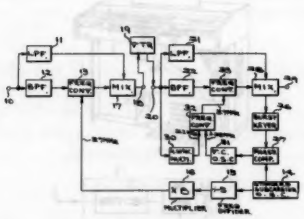
Mitsuo Fujita, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 18, 1970, Ser. No. 12,249

Claims priority, application Japan, Feb. 21, 1969, 44/12553

Int. Cl. H04n *9/02, 1/28*

U.S. Cl. 178—5.2 R **2 Claims**



A color video signal recording and reproducing system frequency converts a carrier chroma signal of a color television video signal to lower its frequency band to a recordable level. This signal is then mixed with a luminance signal of a limited frequency band to produce a combined signal which is supplied to a monochrome video tape recorder for recording on a magnetic tape. The frequency and phase of a color burst signal of a carrier chroma signal has a variation in the timing axis. An automatic phase control circuit takes this burst signal out of a video signal reproduced from the magnetic tape. The phase control circuit comprises a feedback loop including a voltage control oscillator, color burst keyer, phase comparator, and at least one frequency convertor. The feedback loop signal is made to agree with the output of a reference subcarrier generator. The carrier chroma signal is frequency converted and combined with a luminance signal taken out from the reproduced signal to provide a color video signal. This color signal includes a carrier chroma signal, from which the variation in the timing axis has been removed, and a luminance signal having a limited frequency band.

3,704,342

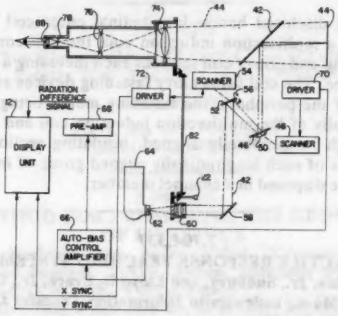
INFRARED SCANNING SYSTEM

James Fred Stoddard, Westwood, Mass.; Francis A. Orabona, Warwick, R.I., and Rodolphe A. Dorval, Dracut, Mass., assignors to Dynarad, Inc., Norwood, Mass.

Filed Jan. 22, 1970, Ser. No. 4,856

Int. Cl. H04n *7/00*

U.S. Cl. 178—6.8 **14 Claims**



An infrared scanning system capable of providing high sensitivity thermal detection and rapid scanning of a field of view by means of small optics and low inertia oscillatory scanners. Visual coaxial viewing of the scanned field is provided and common focusing of the visual and infrared channels permit rapid and simple focus control. The system includes a flicker-free visual display operative in an intensity mode to present a full gray scale radiometric picture, and in an isotherm mode to present intensified presentations of selected temperature ranges.

3,704,343

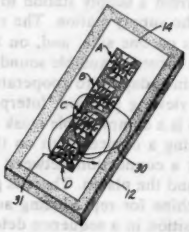
CHARACTER GENERATOR

Lawrence K. Howard, 14812 Addison Street, Sherman Oaks, Calif.

Filed Oct. 5, 1971, Ser. No. 186,697

Int. Cl. G08c *21/00*

U.S. Cl. 178—30 **11 Claims**



A manually operated device for generating alphanumeric character information for an output device such as a printer or

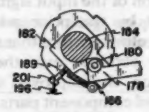
a display or a transmission line. An insulating plate with one or more character units, each comprising inner and outer sets of four contact segments, with the operator moving a stylus or finger over the plate and segments to selectively actuate control circuits for the output device. An eight bar character including four bars forming a rectangle and four bars radiating from the center to the corners of the rectangle.

3,704,344

VEHICLE DATA RECORDER

Reed A. Newmeyer, 4521 West Claremont Street, Glendale, Ariz.

Filed July 11, 1969, Ser. No. 841,033
Int. Cl. G01p *13/00*
U.S. Cl. 346—40 **3 Claims**



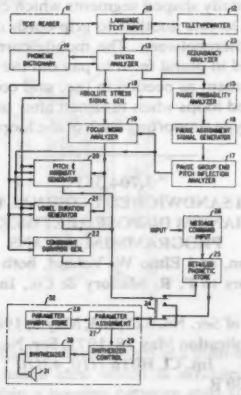
Vehicle data recorder system including method and apparatus which, without constant attention of the operator, makes a printed recording of the velocity, direction of travel of each vehicle actuating the recorder and the time of day each vehicle actuates the recorder. One preferred embodiment has concentric printing platens which move relative to one another and relative to a printing zone so that the current time of day and the velocity of the actuating vehicle are simultaneously disposed within the printing zone. A clock mechanism determines the position of the time of day platen so that the correct time of day is in the printing zone. Spaced vehicle sensors serially sense a moving vehicle and generate an electrical signal which causes the velocity printing platen to move until the vehicle velocity is within the printing zone. A predetermined sequence of activation of the sensors causes the direction of travel of be printed. A total vehicle count is accumulated on a tabular readout. Another presently preferred embodiment converts the vehicle speed and time of day into encoded pulses which actuate a punch or printer to encode punch tape or print out with the data described above.

3,704,345

CONVERSION OF PRINTED TEXT INTO SYNTHETIC SPEECH

Cecil Howard Coker, Chatham Township, Morris County, and Noriko Umeda, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed March 19, 1971, Ser. No. 126,200
Int. Cl. G10l *1/10*
U.S. Cl. 179—1 SA **9 Claims**



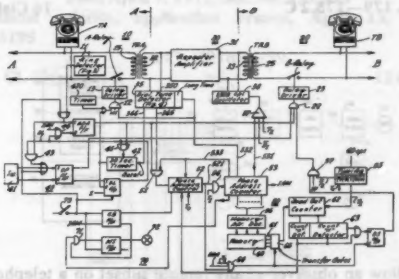
A system is disclosed for converting printed text into speech sounds. Text is converted to alpha-numeric signal data, for example, by a scanner and dictionary lookup. Syntax of the input information is then analyzed to determine the proper phrase category, e.g., subject, verb, object, etc., of word intervals, and to assign pause, stress, duration, pitch and intensity values to the words. From these data a phonetic description of each word is found in a stored dictionary, modified by the accumulated data, and used to prepare synthesizer control signals.

3,704,346

TELEPHONE SWITCHING AND FORWARDING SYSTEM

Lloyd M. Smith, Canoga Park; James B. Scott, Tarzana, and William H. Wertz, Newberry Park, all of Calif., assignors to Commatic Systems, Chatsworth, Calif.

Filed Jan. 28, 1970, Ser. No. 6,487
Int. Cl. H04m *3/54*
U.S. Cl. 179—18 BE **36 Claims**



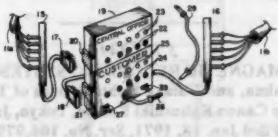
Described herein is a call diversion system for receiving a telephone call, dialing out a different number through a second line and linking the two lines. When identification is needed, an identification code is likewise transmitted subsequent to dial-out. A conversation monitor detects absence of communication to permit a timer to run for testing whether temporary interruption of a line evokes dial tone to reset the system. The number to be dialed out can be reprogrammed locally or remotely by sending signals into the system. The number to be dialed out is held in a memory having, for example, individually addressable locations. Automatic dial-out proceeds by a counting process for accurately timing dial pulses and pauses. During operation memory address sequences alternate with dial tone search phases. A subscriber can initiate an immediate dial-out from a remote location. The system diverts calls immediately in the operate mode but defers diversion in the standby mode, giving the user opportunity to answer the phone directly.

3,704,347

TELEPHONE CABLE RESTORER SYSTEM

Robert Warren Brown, Whittier, Calif., assignor to General Telephone Company of California

Filed June 28, 1971, Ser. No. 157,279
Int. Cl. H04m *3/22*
U.S. Cl. 179—91 R **2 Claims**



A method and portable panel structure for carrying out the method serve to restore rapidly telephone service to customers after a telephone cable connecting the customers' lines to a central office has been inadvertently severed. Ar-

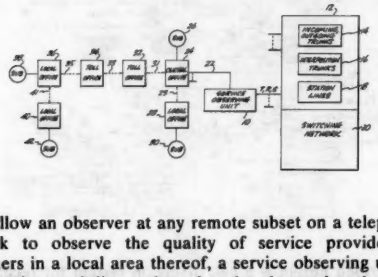
bitrary connections from the severed portion of the cable extending from the central office are made to central office jacks in the panel and arbitrary connections from the severed cable portion extending from the customer's premises are connected to customer jacks on the panel. A tester's plug or answer cord together with a voltage source, ringing generator, and test unit are provided in the panel and enable a tester to identify a customer's telephone number and patch the same with one of several patch cords to the proper central office jack thereby immediately restoring service.

3,704,348

SERVICE OBSERVING SYSTEM

Alexander Charles McIntosh, Oak Harbor, and Maurice Irvin Smith, Kirkland, both of Wash., assignors to Tel-Tone Corporation, Kirkland, Wash.

Filed Nov. 6, 1970, Ser. No. 87,464
Int. Cl. H04m *3/22*
U.S. Cl. 179—175.2 C **16 Claims**



To allow an observer at any remote subset on a telephone network to observe the quality of service provided to customers in a local area thereof, a service observing unit is connected to each line and trunk to be observed at the local area and to an incoming trunk from an adjacent central office. When the remote observer dials a connector number at the central office assigned to the service observing unit, an observer line connector connects the unit to the remote observer and transmits an identity tone thereto. The remote observer must then dial a security access code comprising a plurality of multi-frequency signals with established inter-signal spacing in a given sequence within a predetermined time period, or a timing and disconnect circuit within the unit releases the connection established by the observer line connector. If a correct code has been dialed, an inhibit signal is provided to the timing and disconnect circuit and an idle tone is transmitted to the remote observer. A plurality of selectors and connectors, one for each trunk or line to be observed, are then enabled by a reset signal. The first of these observed trunks or lines to have a calling signal thereon is detected by its corresponding selector which then supplies an inhibit signal to the remaining selectors and connects its line or trunk through its connector to an amplifier, and a hybrid bridging network to the remote observer. To select another line or trunk, the observer dials the last multi-frequency signal of the security access code so that a reset signal is supplied to all the selectors. To disconnect, the remote observer may place his subset on-hook or dial a disconnect multi-frequency signal. A solid-state embodiment of the unit is also discussed, as is a modification allowing selective access by the remote observer to a plurality of trunk or line groups.

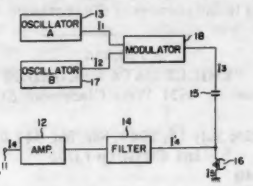
3,704,349

MAGNETIC RECORDING SYSTEM

Takeshi Goshima, and Yutaka Kohtani, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1971, Ser. No. 106,979
Claims priority, application Japan, Jan. 21, 1970, 45/5891
Int. Cl. G11b *5/02*
U.S. Cl. 179—100.2 R **6 Claims**

An improved magnetic recording system is provided which uses an amplitude-modulated high frequency bias. A first high frequency bias or carrier is amplitude-modulated by a second bias component or modulating wave having a frequency higher than the highest frequency of the input signal but lower than that of the first bias component, and the amplitude-modulated high frequency bias is superposed upon the input



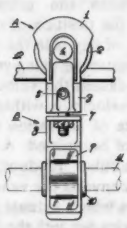
signal. The deterioration of the input signal, especially its high frequency component by the prior art unmodulated high frequency bias may be eliminated so that the flat reproduction characteristic may be obtained over the wide range of the input signal. In addition, the improved system requires only the minimum number of component parts.

3,704,350

CORD HANGERS FOR HOIST

Akira Itoh, 7, 3-chome, Higashino-cho, Kohama, Sumiyoshi-ku, Osaka, Japan

Filed Sept. 23, 1970, Ser. No. 74,553
Int. Cl. H02g *7/06*
U.S. Cl. 191—12 R **12 Claims**



A mobile carrier apparatus for detachably supporting from an elongated supporting cable or rod a flexible element of extensible character such as an insulated electric power cord or a fluid conduit connectable with a work member serviced by said flexible element. The carrier is made up of a composite element-hanger having detachably connected upper and lower brackets, each having a freely rotatable roller or pulley wheel disposed above and below the supporting cable. From the lower bracket there depends in swivel like fashion a further composite cord-gripping support made from a pair of separable complementally shaped segments which can be adjustably closed relative to one another to grip cords of varying cross-sectional size therebetween. The mobile carriers of this type are usually used in plural form to pay out the supported flexible cord or element as needed in use, said cord usually being formed in coiled loops when returned after use with a mobile carrier of this type supporting each of the loops.

3,704,351

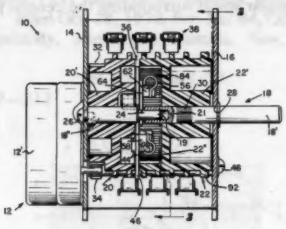
TIMER WITH SANDWICHED INTERNAL ESCAPEMENT MECHANISM DISPOSED BETWEEN TWO PROGRAMMING MEANS

Wallace L. Linn, and Elmo W. Voland, both of Indianapolis, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 821,833, May 5, 1969, abandoned. This application May 28, 1971, Ser. No. 148,224
Int. Cl. H01h *7/10, 43/10*
U.S. Cl. 200—38 R **14 Claims**

A timer has first and second cam programming means rotatably driven about a common axis at different speeds with

one of the cam programming means being driven in response to the rotation of the other cam programming means, the two



cam programming means being coupled together by an escapement means sandwiched between the two cam programming means.

3,704,352

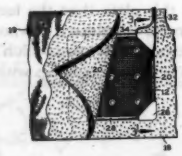
COMPOSITE SEAT AND SWITCH

John G. Fontaine, 2817 N.E. 26th Court, Fort Lauderdale, Fla.

Filed Nov. 17, 1971, Ser. No. 199,518

Int. Cl. H01h *3/14*

U.S. Cl. 200—85 R **10 Claims**



A composite seat and switch incorporating elements of a seat of an automotive vehicle and including sheets having electrical contacts which make and break through openings in a resilient, compressible, insulating separator, the sheets and separator cooperating with a seat padding layer, springs and a seat cover.

3,704,353

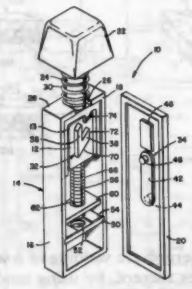
ALTERNATE ACTION MECHANISM WITH MAGNETIC LATCH CAM FOLLOWER BIASING MEANS

Richard C. Halla, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 16, 1970, Ser. No. 72,736

Int. Cl. H01h *13/56*

U.S. Cl. 200—153 J **1 Claim**



A bistable mechanical device, such as a push-to-make/push-to-break switch has a cam which is arranged for manual reciprocation within a housing between start stroke and end stroke positions. A spring urges return of the cam to the latter position. A rockable follower is carried from the housing and is urged toward a beginning aspect by a permanent magnet which is secured from the housing. The follower is rocked by the cam during a first push and moves: (1) toward cam latching condition under influence of the permanent magnet, as the cam moves from its end stroke position toward its start stroke position following the first push to fix the cam parts in a first or latched relative position; and (2) out of said latching condition under influence of the permanent magnet during a subsequent push, as the cam moves from latched position to end stroke position.

3,704,354

ARC IGNITER CIRCUIT CLOSING DEVICE AND METHODS OF OPERATION THEREOF

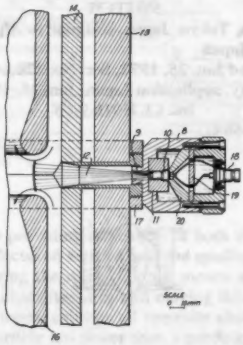
Guy Jean Theodore Lagofun, Tarbes, France, assignor to Etat Francais represente par Le Ministre Charge de La Defense Nationale Delegation Ministerielle pour L'Armement

Filed April 7, 1971, Ser. No. 131,929

Claims priority, application France, April 13, 1970, 7013195

Int. Cl. H01h *33/59*

U.S. Cl. 200—144 R **12 Claims**



An arc is struck across a gap between opposed contacts of a circuit maker by detonation of an explosive to produce a rapid flow of ionized gas and guiding the gas flow to the gap.

3,704,355

HANGING TYPE SWITCH CONSTRUCTION

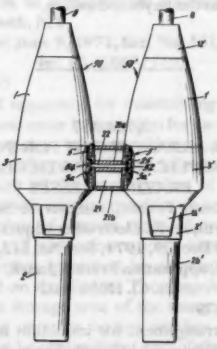
Uwe Lichtenvort, Essen; Johannes Kluge, Wetter, and Meinolf Schleyer, Unna, all of Germany, assignors to Demag AG

Filed May 13, 1971, Ser. No. 142,931

Claims priority, application Germany, May 16, 1970, P 20 24 109.2

Int. Cl. H01h *9/06*

U.S. Cl. 200—157 **13 Claims**



A hanging-type switch construction includes an insert carrier which is adapted to carry all of the switching elements and

which is adapted to be secured to a bottom portion of a housing which is adapted to carry the push button switch actuating mechanism. The push button mechanism includes a pivotal lever which becomes engaged with the switching lever mechanism of the switching elements. The bottom part also forms a handle. The housing includes an intermediate or central part which is interengaged with the bottom part and which includes a pivotal support which engages around a journal portion of the insert carrier for the switching elements. The top part of the housing also interengages with the central part and it includes an inlet at its top for the connecting cable and it also carries means for clamping this top part to the insert carrier. By making the central part of a plastically deformable material it is possible for the upper part to twist relative to the lower part without destruction of the housing and it is also possible to interconnect several housings by connecting their elastically dependable central parts together.

3,704,356

DEVICE FOR FIXING A SWITCH UNIT IN A KEYBOARD SWITCH

Makoto Yanaga, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1972, Ser. No. 220,666
Claims priority, application Japan, Jan. 25, 1971, 46/2734
Int. Cl. H01h 9/08
U.S. Cl. 200—168 C **2 Claims**

A device for fixing a switch unit into a keyboard switch. The switch unit is rectangular and has at least one stopper projected at one upper corner thereof, a knob engaging portion formed at the upper center thereof, and a pair of projections formed at opposite side surfaces thereof. A keyboard plate formed in a U shape has a plurality of bridge portions and a pair of cutouts for engaging the projections of the switch unit to fix the switch unit therein. A keep leaf spring having a center hole for turnably engaging the knob engaging portion of the switch unit is held under the bridge portions of the keyboard plate at opposite ends thereof when turned in longitudinal direction of the keyboard plate and is used to hold the switch unit into the keyboard switch.

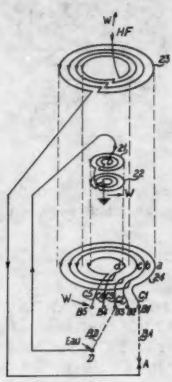
3,704,357

INDUCTOR ARRANGEMENT FOR INDUCTION HEATING APPLICATION PARTICULARLY FOR BRAZING PRESSES

Jean Moulin, Massy, France, assignor to Societe De Traitements Electrolytiques Et Electrothermiques (Stel)

Filed Dec. 29, 1971, Ser. No. 213,295
Claims priority, application France, Jan. 8, 1971, 7100521
Int. Cl. H05b 9/02
U.S. Cl. 219—10.79 **8 Claims**

An inductor arrangement for induction heating of one or more flat circular plates of different diameters including a first set of windings always active during operation of the brazing press and a second set of windings selectively inserted in series with the first set. The first set comprises a central portion including on or more small diameter pancake coils covering the center of the plate to be heated and a peripheral portion made up of a flat annular spiral surrounding the central portion and



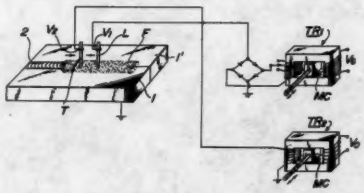
further away from this plate than the latter. The second set comprises a flat annular spiral each of whose turns is tapped so as to insert that one or pair of turns which faces the peripheral zone of the plate to be heated in series with the first set.

3,704,358

SUBMERGED-ARC BOTH-SIDE BUTT WELDING METHOD OF A SQUARE GROOVE

Tatsuo Saito, Kobe; Kozo Akahide, and Teruo Ukebe, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Fukiai-ku, Kobe, Japan

Filed Nov. 23, 1971, Ser. No. 201,340
Claims priority, application Japan, Dec. 14, 1970, 45/110804
Int. Cl. B23k 9/18
U.S. Cl. 219—73 **8 Claims**



A method for submerged-arc welding of a square butt joint from opposite surfaces thereof, by using tandem electrodes. The tandem electrodes are moved at 50 to 120 cm/min, relative to the joint, while passing a current I_1 of 1,000 to 2,000 amperes through the leading electrode, while keeping the trailing electrode current I_2 to one-fourth to four-fifths of I_1 and the arc voltage of the leading electrode at $(I_1/40)+15$ to $(I_1/40)+35$ volts. The welding operations from the opposite surfaces are conducted under similar conditions.

3,704,359

STORAGE PANELS, PARTICULARLY FOR HEATED FLOORS

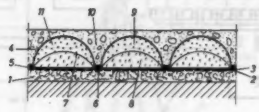
Nikolaus Laing, 7141 Aldingin-bei, Hofener Weg, Germany

Filed Oct. 28, 1970, Ser. No. 84,733

Claims priority, application Austria, Nov. 4, 1969, A 10333/69

Int. Cl. H05b *1/00*

U.S. Cl. 219—213 21 Claims



A heat storage panel consisting of a container, preferably of plastics material, and filled with a storage mass which gives off its heat of crystallization at a predetermined temperature.

3,704,360

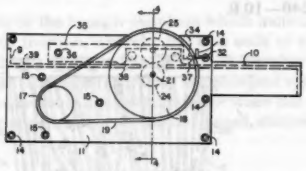
CARD READER

Bruce R. McFadden, 92 Ardmore Street, Framingham, Mass.

Filed April 15, 1970, Ser. No. 28,759

Int. Cl. H04m *17/02*; G06k *7/015*; B65h *5/22*

U.S. Cl. 235—61.11 R 8 Claims



Information recorded along a line on a card is detected by driving the card past a detector adjacent the line when the card is inserted into a slot, the drive mechanism then reversing after the information is detected so that the card is expelled from the same slot.

3,704,361

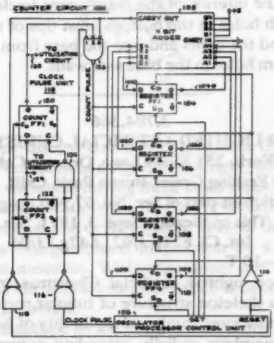
BINARY SYNCHRONOUS UP/DOWN COUNTER

Albert D. Patterson, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed April 30, 1971, Ser. No. 138,973

Int. Cl. H03k *21/06*

U.S. Cl. 235—92 CP 21 Claims



A binary counter consisting of a binary adder and flip-flops, the Q outputs of the flip-flops being connected to the A inputs of the adder, the Σ outputs of the adder being connected to the D inputs of the flip-flops. By connecting the B input of the adder to any of several combination of source voltages, the counter may be used as a down counter or an up counter wherein the sequence of steps up or down is selectively variable.

A count pulse may be provided for pulsing in the new count to the flip-flops. In addition, a set signal may be provided to load the flip-flops and a reset signal may be provided to clear the flip-flops.

3,704,362

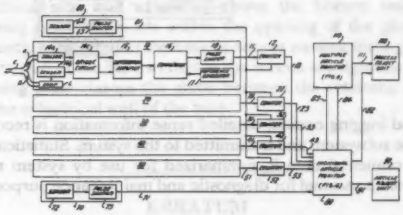
QUALITY CONTROL SYSTEM

Mark J. Kolby, Maywood, and Henry T. Goldbach, Little Ferry, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed June 3, 1971, Ser. No. 149,618

Int. Cl. G06f *15/46*

U.S. Cl. 235—151.13 11 Claims



A system for providing indication of both the quality of individual manufactured articles and the quality of the process for manufacturing the same. Circuit means are included for sensing article characteristics and making determinations (1) whether each article exhibits all requisite characteristics, (2) whether each article has fewer than a predetermined number of requisite characteristics, and (3) whether each article is a predetermined succession exhibits less than the requisite number of characteristics. Circuit means are provided for indicating the determinations made and for conveying indications of determinations (1) to article control apparatus and indications of determinations (2) and (3) to process control apparatus.

3,704,363

STATISTICAL AND ENVIRONMENTAL DATA LOGGING SYSTEM FOR DATA PROCESSING STORAGE SUBSYSTEM

Oscar E. Salmassy, and Robert E. Sullivan, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

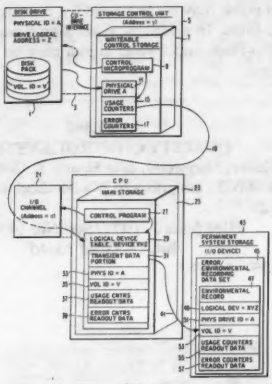
Filed June 9, 1971, Ser. No. 151,503

Int. Cl. G06f *11/00*

U.S. Cl. 235—153 3 Claims

A method and apparatus for maintaining a statistical data record of usage and error information for each physical device and for physical storage volumes within each physical device, in a data storage subsystem. Usage information provides an accumulated count of the total number of various types of usage, while error information provides an accumulated count of the total number of various types of errors encountered during the usage. All such information is identified by physical device and is further identified by physical ID of a storage volume mounted on the device. The usage/error information is off-loaded to a storage area of the using system each time one of the usage or error counts reaches a predetermined threshold, and can be off-loaded at end-of-day, or at a physical volume change time in order to allow a summary by time period and by storage volume ID. An environmental data

logging mode is initiated when an intolerable amount of errors of a given type is encountered, and for the next predetermined number of times that the particular type of error which initiated logging occurs, detailed sense information is recorded by the subsystem and transmitted to the system. Statistical and environmental data is summarized for use by system maintenance personnel for diagnostic and maintenance purposes.

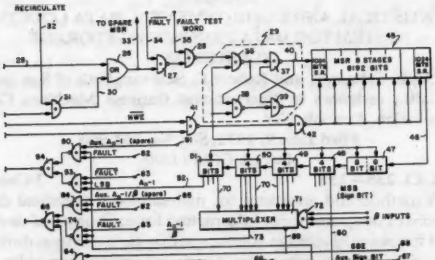


3,704,364

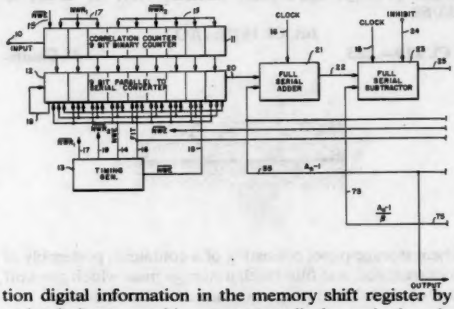
DIGITAL MEMORY SHIFT REGISTER INCORPORATING TARGET DATA AVERAGING THROUGH A DIGITAL SMOOTHING LOOP

Eugene R. Roeschlein; Donald C. Weiss, and David L. Zeph, all of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 10, 1970, Ser. No. 88,432
Int. Cl. G06f 7/50
U.S. Cl. 235—176 **6 Claims**



A digital memory shift register subsystem having a series of eight 1,024 bit shift register modules coupled together to create serial storage of 512 16-bit digital words of target information through a full adder and a full subtractor, a part of the digital memorized target information being taken as an output from the memory shift register prior to its end bit and conducted to a supplemental shift register and multiplexer combination circuit to add in and subtract from the target information digital information in the memory shift register by this recirculation to provide outputs to a display and other circuits of a sonar receiver.

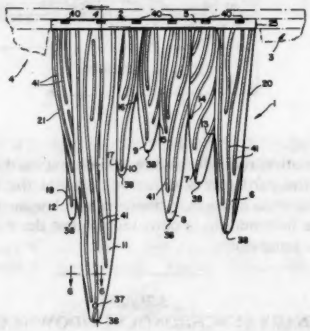


3,704,365

ARTIFICIAL LIGHTED ICICLE

Earl A. Miller, P.O. Box 396, Orem, Utah

Filed Jan. 25, 1971, Ser. No. 109,141
Int. Cl. F21v 3/02
U.S. Cl. 240—10 R **11 Claims**



The artificial icicle device has a plurality of hollow icicles depending from a base that is to be secured to the eaves of a building, with the icicles being aligned and interconnected to form a chamber into which one or more electric lights extend for lighting the interior of the translucent icicles. Cooling air flows through holes in the bottom-most tips of the icicles, upwardly around the lights and into the base from which it flows upwardly from holes in the base side walls.

3,704,366

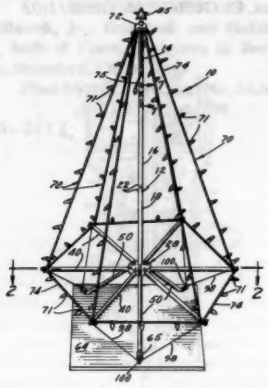
OUTDOOR LIGHTED ARTIFICIAL CHRISTMAS TREE

Lawrence J. Korb, 251 Violet Lane, Orange, Calif., and Joseph Soja, 8229 Ersking Green, Buena Park, Calif.

Continuation-in-part of Ser. No. 67,980, Aug. 28, 1970, abandoned. This application Sept. 3, 1971, Ser. No. 177,791
Int. Cl. F21p 1/02; A47g 33/06
U.S. Cl. 240—10 T **12 Claims**

An outdoor, lighted, artificial Christmas tree decoration comprising a skeleton structure of tubular members having a vertical main support trunk and a plurality of horizontal tubular branch members radially extending outwardly from the main trunk, the trunk and the tubular branch members being detachably secured to an annular hub having included therein securing means for removably securing a plurality of

downwardly depending support legs from the hub, whereby the artificial tree can be rigidly attached to a base by means of the support legs. Disposed at the upper end of the main trunk is an electrical junction box in which a plurality of downwardly-extending electrical wires are operably connected to an inlet line, the wires being removably attached at



respective ends of the branch members which include clamping means fixed thereon, whereby the free ends of each wire extend horizontally to the adjacent branch member and are secured thereto. The electrical wires are provided with evenly spaced light sockets and lights which are lit when the inlet line is operably connected to a commonly used electric power source.

3,704,367

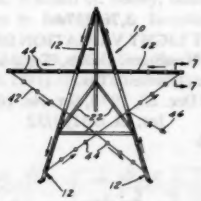
LIGHTED CHRISTMAS STAR DISPLAY

Lawrence J. Korb, 251 Violet Lane, Orange, Calif.

Filed Nov. 12, 1971, Ser. No. 198,264

Int. Cl. F21p *1/02*; **A47g** *33/00*

U.S. Cl. 240—10 S **8 Claims**



There is herein disclosed an outdoor, lighted, Christmas star display device comprising a rigid, lightweight, skeleton structure of tubular members having three main support legs forming a tripodic configuration, the legs being secured together at their outermost ends and evenly spaced apart at the lowermost ends, said legs being secured in position by a plurality of horizontal truss members. Within the upper half of the structure is affixed a horizontal cross bar which is connected to the two forward legs thereof.

Removably attached to the skeleton structure is a string of electrical wires provided with evenly spaced light sockets and lights which are lit when the inlet plug secured thereto is operably connected to a commonly used electric power source.

3,704,368

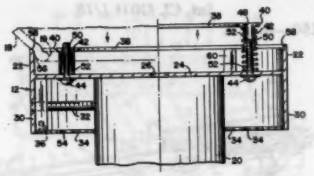
MOUNTING DEVICE FOR A LIGHT FIXTURE GLOBE

Leon R. Patry, Medina, Ohio, assignor to Adjusta-Post Manufacturing Company, Akron, Ohio

Filed June 15, 1971, Ser. No. 153,252

Int. Cl. F21v *17/06*

U.S. Cl. 240—128 **6 Claims**



A base for mounting a globe having an opening therein to a light fixture. The base has a body portion with a bottom wall a cylindrical side wall extending above the bottom wall. A retaining plate which fits within the opening of the globe is resiliently connected to the base by screws passing through the bottom wall of the base so that as the screws are tightened the retaining plate clamps the globe between the retaining plate and the cylindrical wall of the base.

ERRATUM

For Class 250—83.6 R see:
Patent No. 3,704,284

3,704,369

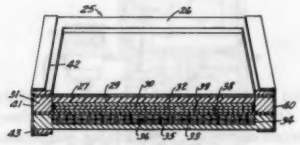
X-RAY FILM CASSETTE

Richard L. Paidosh, Saint Anthony, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1971, Ser. No. 111,526

Int. Cl. G03b *41/16*

U.S. Cl. 250—65 R **14 Claims**



An X-ray cassette which is convenient for changing the film and which is thin and light-weight. The cassette provides intimate contact between the intensifying screens and the X-ray-sensitive film by the use of continual magnetic forces.

3,704,370

RADIOGRAPHIC INSPECTION TECHNIQUE

William L. Shelton, Springfield, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed April 9, 1971, Ser. No. 132,821

Int. Cl. G03b *41/16*

U.S. Cl. 250—65 R **8 Claims**

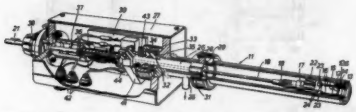
A contrast enhancement technique for use in radiography involves impregnating material to be inspected by nondestructive radiographic techniques with a tetrabromoethane prior to carrying out the actual radiographic inspection and then removing the tetrabromoethane.

3,704,371

RADIATION DETECTION FOR SOFT X-RAYS

James Anthony Cairns, Didcot, and Colin Leonard Desborough, Faringdon, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 1, 1970, Ser. No. 42,166
Claims priority, application Great Britain, May 30, 1969, 27,660/69
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R 14 Claims



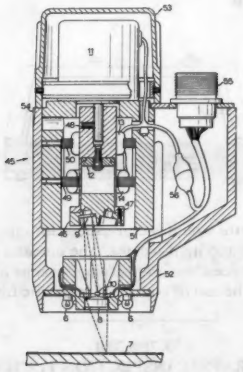
The apparatus comprises a proportional counter with a long tubular nose-piece having an end window. The anode is a short wire parallel to the window and mounted on a support so that the support together with the anode is easily removable and replaceable. The support may be axially movable within the long tubular nose-piece, whereby sensitive tuning to specific characteristic X-rays is possible.

3,704,372

OPTICAL PATTERN TRACER

Robert E. Parker, Dundas, Ontario; Malcolm A. Lodge, Charlottetown, Prince Edward Island, and George S. Jewell, Ancaster, Ontario, all of Canada, assignors to Canadian Westinghouse Company Limited, Hamilton, Ontario, Canada

Filed Oct. 19, 1970, Ser. No. 81,784
Claims priority, application Canada, Oct. 20, 1969, 065212
Int. Cl. G05b *1/00*
U.S. Cl. 250—202 2 Claims



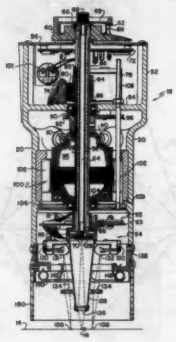
A rotary scan line/edge tracer using a motor driven mirror to produce the rotary scan. The motor also drives a generator for providing two coordinate reference signals. The mirrors assembly is exchangeable to provide varying scan diameters. The photocell is mounted adjacent the center of the focusing lens at the lower part of the apparatus, thus permitting a coaxial arrangement of the motor and mirror and lens producing a compact assembly. The reference signals are sampled instantaneously to produce coordinate drive signals.

3,704,373

SCANNING HEAD ARRANGEMENT HAVING SERVO MOTOR ARMATURE SECURED TO SHAFT ON WHICH PHOTOCELL IS CARRIED

Francis G. Bardwell, Elmhurst; John W. Dobrauz, and Frank L. Sobchak, both of Chicago, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Sept. 30, 1971, Ser. No. 185,282
Int. Cl. G05b *19/36*; G06k *11/02*
U.S. Cl. 250—202 13 Claims



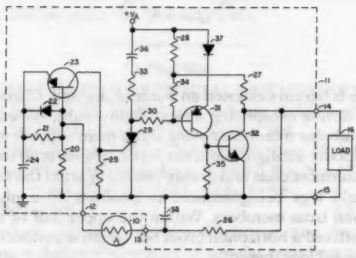
The following specification describes a tracing scanning head having a photocell for sensing the presence of a pattern. The cell is supported on one shaft of a pair of coaxial shafts for movement transverse to the shaft axes. A pinion carried by the other shaft engages a rack carried by the one shaft for moving the photocell in response to rotation of the other shaft to compensate for the kerf or tool cutting width. A servo motor armature is fixed to the one shaft and rotates the one shaft and photocell to maintain the photocell angularly aligned with the line. A pair of easily readable knobs are provided at the upper end of the shafts to permit the offset to be easily determined. A preamplifier is carried by the one shaft to amplify low level photocell signals before they are transmitted over slip rings and brushes, and a neon bulb shielded by a metal ring casting lights the drawing pattern. A transparent shield depending from the casting protects the photocell lens. A pair of lamps cast indicia on the paper to enable the direction of scanning head travel to be easily ascertained.

3,704,374

AMBIENT LIGHT VARIATION DETECTOR

Theodore Phillip Kaufman, Dallas, Tex., assignor to Control Technology, Inc., Garland, Tex.

Filed Dec. 23, 1970, Ser. No. 100,923
Int. Cl. G01j *1/32*
U.S. Cl. 250—206 5 Claims



Disclosed is a method and apparatus for supplying a control signal in response to an abrupt change in ambient light level and for maintaining such control signal for a controlled time period irrespective of subsequent light level changes during

such controlled time period, such apparatus including a photo-resistor coupled by an input transistor amplifier stage to the trigger input of a silicon controlled rectifier. The silicon controlled rectifier is coupled to an output transistor amplifier stage which provides such control signal.

3,704,375

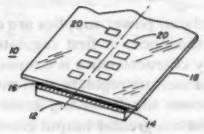
MONOLITHIC DETECTOR CONSTRUCTION OF PHOTODETECTORS

Joseph E. Slawek, Jr., Trumbull, and Harvey W. Altemose, Norwalk, both of Conn., assignors to Barnes Engineering Company, Stamford, Conn.

Filed May 5, 1970, Ser. No. 34,668

Int. Cl. H01l *15/00*

U.S. Cl. 250—211 J **10 Claims**



Photodetector single-element and multi-element arrays of the photovoltaic type are fabricated by photoetching and sensitizing a large semi-conductor PN junction wafer for delineating the desired active junctions. An evaporated coating of dielectric material is supplied covering only a small portion of each active element and then followed by a metallic coating which makes ohmic contact with the active elements. The entire region except for the external lead pattern is then passivated with a coating of dielectric material. A metallic coating is then applied to overlay the ohmic contact areas of the active element. The wafer is then diced into individual detectors or arrays which are mounted on substrates and external leads are then connected to the external lead pads. This construction then allows for the application of interference filters, apertures stops, coded reticles, and/or guard rings to each detector element.

3,704,376

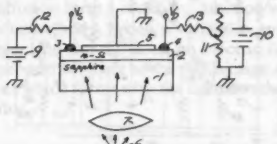
PHOTO-ELECTRIC JUNCTION FIELD-EFFECT SENSORS

Kurt Lehovec, and William G. Seeley, both of Williamstown, Mass., assignors to Inventors & Investors, Inc., Williamstown, Mass.

Filed May 24, 1971, Ser. No. 146,322

Int. Cl. H01j *39/12*; H01l *11/00, 15/00*

U.S. Cl. 250—211 J **26 Claims**



The invention concerns improved semiconducting light sensors based on field effect transistor structures. A potential extremum is generated in the channel by illumination and its shift is used as vehicle for minority carrier transport. Photosensitive field effect transistors are integrated with minority carrier sensors.

3,704,377

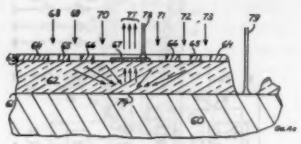
LASER COMPRISING FRESNEL OPTICS

Kurt Lehovec, Williamstown, Mass., assignor to Inventors and Investors, Inc., Williamstown, Mass.

Division of Ser. No. 653,245, July 13, 1967, Pat. No. 3,569,997. This application July 10, 1970, Ser. No. 61,022

Int. Cl. G02f *1/28*; H01j *1/62*; H01s *3/00*

U.S. Cl. 331—94.5 D **7 Claims**



This invention concerns improved structures for the transformation of radiant energy into electric energy or vice versa. The improvement consists of combining a semiconducting microcircuit element with a Fresnel optical system into a compact integrated structure.

3,704,378

VIEWSCOPE FOR THE BLIND

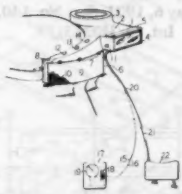
Morse Robb, Trent Road, R. R. 3, Belleville, Ontario, Canada

Filed April 13, 1971, Ser. No. 133,624

Claims priority, application Canada, April 17, 1970, 080,366

Int. Cl. H01j *39/12*

U.S. Cl. 250—222 R **15 Claims**



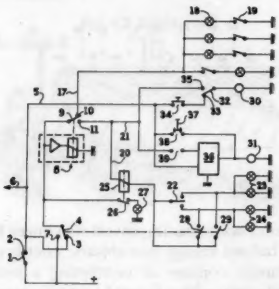
A light-weight headworn scanning system of concave mirrors on a wheel, with a detector-capsule for both visible and infrared radiation, the generated signals from incoming radiation being used to convert the scanned object or scene into a touch-felt image on the skin. A fine wire brush revolving with the mirror-wheel distributes amplified electric signals from the detector to a circle of contacts whose wires lead to an individually form-moulded forehead panel or receiver made up of several hundred electro-motive components, each of which represents a particular tiny spot of the scanned scene and will be activated to touch and withdraw from the forehead skin according to the brightness or darkness of that particular spot in the scene. These electro-motive components of special new design make electrical connection in the system by simple insertion in a uniquely constructed panel, and are as readily removed for inspection. Focus is obtained by moving the detector-capsule nearer to or farther from the concave mirrors, and a plane mirror-(s) can be used to reflect rays from them in a backward direction to the detector in order to accommodate focal length in reduced space. A fan revolving with the mirror-wheel moves air to ventilate the space between the tactile component panel and the forehead.

3,704,379

ELECTRICAL SYSTEM FOR AN AUTOMATIC VEHICLE

Ladislaw Siehofer, Plessis-Robinson, France, assignor to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France, part interest to each

Filed June 28, 1971, Ser. No. 157,148
Claims priority, application France, July 3, 1970, 7024722
Int. Cl. H02g 3/00
U.S. Cl. 307—10 LS 5 Claims



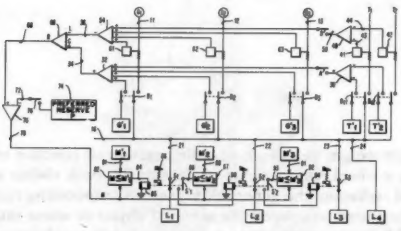
Electrical system for an automobile vehicle, comprising a plurality of apparatuses, such as direction-changing indicators, to be supplied with power. A main switch having an "on" contact is interposed between the apparatuses and the power source. A second switch is connected in series between the source and those of the apparatuses which are desired to operate in a cadenced manner. A cadenced signal generator is interposed between the "on" contact of the main switch and ground and is adapted to actuate the second switch in a cadenced manner.

3,704,380

LOAD SHEDDING APPARATUS

Nathan Cohn, Jenkintown, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed May 6, 1971, Ser. No. 140,774
Int. Cl. H02j 3/38
U.S. Cl. 307—52 7 Claims



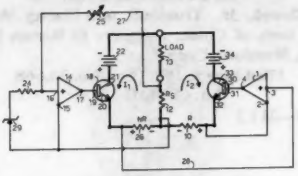
An arrangement which provides for automatically shedding the separable loads of a power distribution area in accordance with predetermined priorities established, not on a basis of system frequency or rate of system frequency change as is present day conventional practice, but on a basis of actual area capability as compared to area load. The total prevailing capability of the power sources of the area is compared with the prevailing area load to produce a signal indicative of the prevailing area reserve power. That signal is compared with the preferred reserve and the difference is then the excess or deficiency with regard to the preferred reserve, defined as the prevailing area margin. That margin in turn is compared with the margin settings for each separable load so that when the margin decreases to a value equal to or below the margin setting for each separable load, that load is automatically sequentially disconnected.

3,704,381

HIGH STABILITY CURRENT REGULATOR CONTROLLING HIGH CURRENT SOURCE WITH LESSER STABILITY

Sarkis Nercessian, Long Island City, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,376
Int. Cl. H02j 1/10
U.S. Cl. 307—53 8 Claims



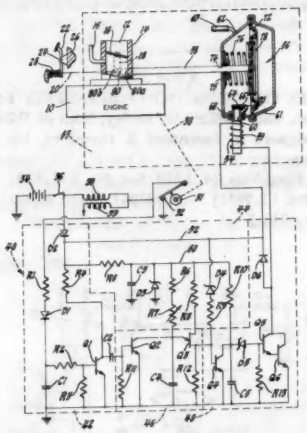
Two current regulated power supplies are connected across a common load impedance. A first regulated power supply having high stability characteristics is connected in a conventional feedback manner to regulate current to the load. A second feedback power supply having lesser stability characteristics than the first but greater output current capabilities is connected to null the sum of opposing voltage drops, one across a current sensing resistor in series with the first power supply and the load and the other in series with the second power supply and the load. The ratio of the resistances of the latter two resistors controls the relative current contribution of the two power supplies to the total load current.

3,704,382

BISTABLE THROTTLE CONTROL SYSTEM

Gerald O. Huntzinger, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 29,111, April 16, 1970. This application July 2, 1971, Ser. No. 159,270
Int. Cl. H03k 5/20
U.S. Cl. 307—233 2 Claims



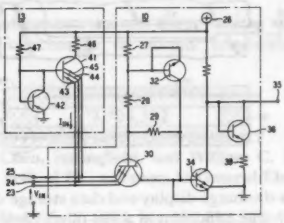
A throttle valve the complete closure of which is prevented by a throttle stop that is advanced be electrically activated vacuum means above a preset speed of an engine responsive to the setting of the throttle valve and retracted below this speed. Pulse generating means connected with the engine provide an input to a timing stage that is operatively connected by capacitor, Zener diode, and amplifier means to means that advance and retract the throttle stop when the speed of the engine is respectively above and below the preset speed.

3,704,383

TRANSISTOR-TRANSISTOR LOGIC CLIPPING CIRCUIT

Cyrus Frank Ault, Wheaton; Ray Allen Reed, Bolingbrook, and William George Reichert, Jr., Wheaton, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 3, 1971, Ser. No. 204,475
Int. Cl. H03k 5/08, 19/08
U.S. Cl. 307—237 7 Claims



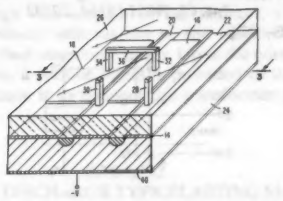
The invention is a combination of a transistor-transistor logic (TTL) gate and a multi-emitter transistor clipping circuit having a different emitter connected to each input of the gate. The multi-emitter transistor is biased so that any signal, reflected by an input of the gate and tending to pull the potential of that input below ground, causes the transistor to conduct and clip the input signal essentially at ground potential.

3,704,384

MONOLITHIC CAPACITOR STRUCTURE

Roy R. DeSimone, Wappingers Falls, and Richard H. Linton, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 30, 1971, Ser. No. 129,497
Int. Cl. H01l 11/14
U.S. Cl. 307—304 2 Claims



This specification discloses a polarized capacitor for use in monolithic structures, particularly those using field effect transistors. One plate of this capacitor is a metal layer overlying and insulated from a semiconductor body which has a diffusion in it adjacent to the overlying metal layer. The boundaries of this diffusion form a rectifying junction with the rest of the semiconductor body. When a voltage is applied between the metal layer and the diffusion an electric field is formed under the layer and adjacent to the diffusion so as to create an inversion layer which forms with the diffusion the second plate of the capacitor.

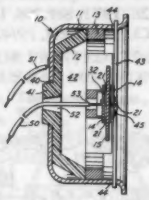
3,704,385

PIEZOELECTRIC TRANSDUCER ASSEMBLY WITH PHASE SHIFTING ACCOUSTICAL PARTS

John C. Schweitzer, and Edward M. Junak, both of Grand Junction, Colo., assignors to Delta Products, Inc., Grand Junction, Colo.

Filed March 2, 1971, Ser. No. 120,252
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 13 Claims

A piezoelectric element which resonates at a predetermined ultrasonic frequency is mounted in a housing structure formed by a cup and insert structure. A resonant cavity is defined in the cup and the element is held adjacent thereto by bosses formed on a pair of mounting chips. The bosses contact the element along its node so that it may vibrate in an unrestrained manner and the mounting chips define acoustical ports therewith on each side of the element which function to



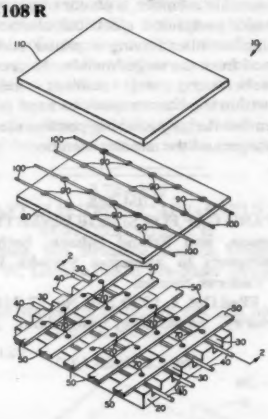
delay and thereby phase shift acoustical waves as they pass therethrough so that acoustical waves at the element's resonant frequency combine in phase at the element's surface. The mounting chips and bosses also function as electrodes and electrical leads are electrically connected thereto for connecting the transducer assembly formed to external circuitry.

3,704,386

DISPLAY PANEL AND METHOD OF OPERATING SAID PANEL TO PRODUCE DIFFERENT COLORS OF LIGHT OUTPUT

Rudolph A. Cola, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed March 19, 1971, Ser. No. 126,154
Int. Cl. H01j 11/02
U.S. Cl. 313—108 R 12 Claims



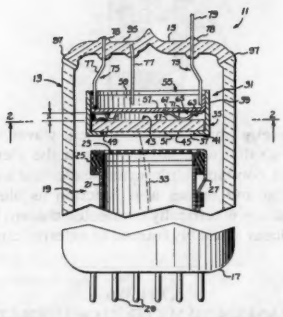
A display panel includes a plurality of cells containing a phosphor material sensitive to ultraviolet light and an ionizable gas which has a characteristic color of cathode glow and, also, generates ultraviolet light when discharged. The gas filling also includes mercury vapor. The method of the invention comprises operating cells at different levels of intensity, determined by input signals so that, at a low level of intensity of cell ionization and current flow, the phosphor is energized and produces its characteristic color of glow which is the dominant light output from the cell. In addition, by operating the panel at a higher level of ionization intensity and current flow, the characteristic color of cathode glow of the gas dominates the phosphor glow and provides the primary glow visible to a viewer. Similarly, if input data signals have widely varying intensities, then the current flow through the display cells varies similarly and the color of light output from the cells varies over a wide range, depending on the relative contribution of each of the components in the cell, the phosphor, the gas, and the mercury.

3,704,387

CATHODE RAY TUBE TARGET STRUCTURE SUPPORTED BY THE FORWARD PORTION OF THE ENVELOPE AND HAVING A THERMAL BARRIER THEREIN

Mark E. Carpenter, and Harry E. Smithgall, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated

Filed Feb. 26, 1971, Ser. No. 119,146
Int. Cl. H01j *1/88, 19/42*
U.S. Cl. 313—257 **11 Claims**



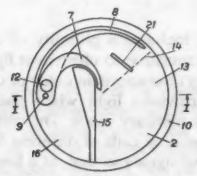
An improved electrical input-output target structure is provided for a cathode ray tube. This structure, being supported by the forward closure portion of the envelope, comprises an annular first metallic member, a planar target member seated thereon to make peripheral electrical contact therewith, a second metallic member having a planar surface predeterminately spaced from the target member to provide a thermal barrier therebetween, and resilient means oriented peripherally within the barrier space to exert pressure against the target member thereby assuring positive electrical contact between the target and the annular member.

3,704,388

SPARK GAP FOR SURGE DIVERTERS

Bengt Johansson, and Erland Nilsson, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 1, 1970, Ser. No. 77,218
Claims priority, application Switzerland, July 6, 1970, 9315/70
Int. Cl. H02h *1/00*
U.S. Cl. 315—36 **8 Claims**



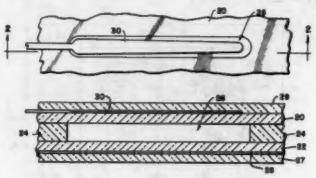
A spark gap for surge diverters is composed of a plurality of plates of insulating material stacked one on the other with spaces there between. Electrodes are carried on each face of the plates. The electrodes have parts connected to each other by attachment members passing through the plates. The electrodes at each space have vertically aligned parts forming a spark gap and the parts deviating from vertical alignment and forming a running-out path which becomes substantially parallel to the plane of the plates.

3,704,389

METHOD AND APPARATUS FOR MEMORY AND DISPLAY

Walter B. McClelland, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed June 24, 1970, Ser. No. 49,436
Int. Cl. H01j *17/36*
U.S. Cl. 315—84.5 **31 Claims**



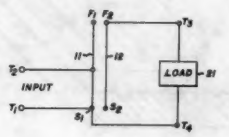
A plasma-discharge display and data storage device wherein a glow discharge condition in a gas-filled, dielectric envelope is transferred from a region between a pair of transferor electrode conductors to a region between a pair of transferee electrode conductors by causing an AC voltage applied between the transferee electrode conductors to cause an associated potential field inside the gas-filled envelope to reach a glow-discharge-sustaining magnitude prior to the time that the AC voltage applied between the pair of transferor electrode conductors causes an associated potential field within the gas-filled envelope to reach a magnitude sufficient to sustain a glow discharge; and a tapered electrode conductor in which a plasma or glow discharge in the gas occurs preferentially near the wide end of the tapered electrode conductor.

3,704,390

COMBINED CAPACITOR-INDUCTOR REACTOR DEVICE HAVING TRANSFORMER CHARACTERISTICS

Frederick W. Grahame, 22 Grant Avenue, Glens Falls, N.Y.

Continuation of Ser. No. 40,272, May 25, 1970, abandoned. This application Jan. 26, 1972, Ser. No. 221,113
Int. Cl. H01f *15/14, 27/02*
U.S. Cl. 315—276 **6 Claims**



A combined capacitor-inductor reactor formed by spaced-apart layers of insulation and conductive foil rolled together around a core member to form a combined capacitor-inductor reactor. By connecting the input supply terminals to two different points on the same conductive foil and deriving the output from across a portion of the second foil which is coextensive with the part of the first coil intermediate the input terminals, the structure will exhibit capacitor connected transformer characteristics suitable for use as a fluorescent lamp starting and ballast circuit.

3,704,391

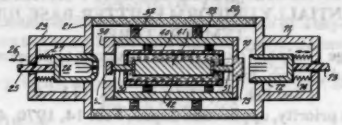
CRYOGENIC CURRENT LIMITING SWITCH

Lorne D. McConnell, Radnor, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Nov. 10, 1970, Ser. No. 88,327
Int. Cl. H02h *7/22*
U.S. Cl. 317—11 C **13 Claims**

A superconductive element to be used for current limiting action is arranged in the interior of a tubular conductor and is in a substantially field-free region during normal current conduction. The vacuum used as thermal insulation for the superconductor element is further used as a switching medium for the contacts of switching devices associated with the super-

conductor. A non-linear resistor material such as pure tungsten is connected in parallel with the superconductor so that



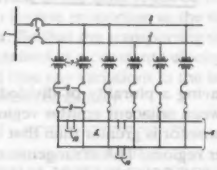
current commutates into the non-linear resistor when the superconductor switches to its normal conduction characteristics.

3,704,392

NETWORK RECLOSING RELAY

Muchuan M. Chen, Springfield, and William C. Kotheimer, Lansdowne, both of Pa., assignors to General Electric Company

Filed Feb. 1, 1972, Ser. No. 222,526
Int. Cl. H02h 3/26
U.S. Cl. 317—23 **9 Claims**



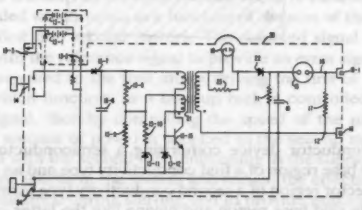
A static protective relay comprises a reclosing unit for controlling a circuit breaker which when closed couples a primary feeder or a source of supply of a three-phase power distribution system to an alternating current secondary network through a network transformer. The reclosing unit senses when a voltage corresponding to the transformer voltage minus the network voltage is within a prescribed angular displacement range with respect to the network voltage and when its magnitude with respect to the network voltage is within a prescribed magnitude range. Upon the coincidence of both conditions, a reclose signal is provided to the network protector to cause it to connect the transformer to the network.

3,704,393

CAPACITOR DISCHARGE TYPE BLASTING MACHINES

Frank J. Digney, Jr., 1 Long Pound Road, Hewitt, N.J., and Earl M. Phinney, 10 Ceperley Avenue, Oneonta, N.Y.

Filed Dec. 30, 1971, Ser. No. 214,187
Int. Cl. F23g 7/02
U.S. Cl. 317—80 **11 Claims**



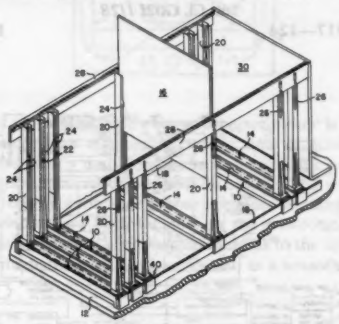
Capacitor discharge blasting machines for initiating electroexplosive devices, e.g., electric blasting caps which comprises in combination, means for supplying direct current at a controlled rate and at potentials above 1,500 volts, a nonelectrolytic capacitor capable of accumulating charges at potentials in excess of 1,500 volts and capable of withstanding repeated charge-discharge cycles, means for indicating that such capacitors are being charged, electronic firing switch and interlock means positioned between and communicating with said capacitor, and electronic firing switch means for delivering current from said capacitor to current output terminals and thence to an electric blasting cap firing circuit, and means for bleeding off unwanted or residual charges from the power supply and current-discharging means.

3,704,394

RECEPTACLE FOR PRINTED CIRCUIT STRUCTURES WITH BUS BAR MOUNTING MEANS

Lennart B. Johnson, Topsfield, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed July 6, 1971, Ser. No. 159,786
Int. Cl. H05k 7/18
U.S. Cl. 317—101 DH **8 Claims**



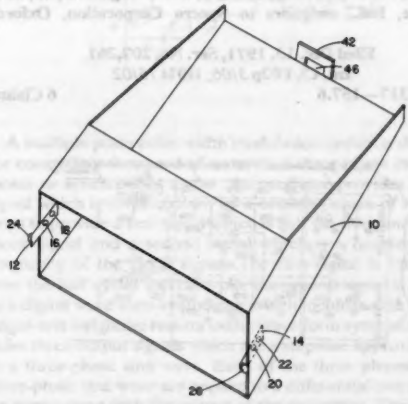
A connection and mounting receptacle for printed circuit cards has pairs of slotted stiffly resilient card guides, each of which has a pair of opposing nodes protruding into the slot from slot-forming side walls which are not connected in the region of the nodes to provide a spring grip on an inserted card, and has two tie beams interconnecting the free ends of the card guides. A connector which seatingly receives the contact-bearing edge of the circuit card carries the paired card guides.

3,704,395

AIRCRAFT ELECTRONIC APPARATUS WITH SUPPORTING RACK

William J. Hamer, 201 Brisbane Avenue, Westerville, Ohio, and Randal W. Goshen, 3520 Liv-Moor Drive, Columbus, Ohio

Filed March 15, 1971, Ser. No. 124,260
Int. Cl. H02b 1/04
U.S. Cl. 317—120 **4 Claims**



A mounting arrangement for positioning and maintaining in position a chassis having apparatus thereon in a rack per-

manently mounted in an aircraft. The chassis/rack for airborne electronic apparatus has a unitized construction exemplified by simplicity of inserting and removing the apparatus from the rack—but is yet extremely rugged to withstand the most severe vibration in an aircraft. The latching mechanism comprises a spring-like pivot arm mounted inside of the chassis with a circular button with spherical crown on an end protruding from the chassis for fitting into and securing the apparatus in the rack. The chassis and rack are of given sizes to permit a snug fit interlock.

3,704,396

SAFETY DEVICE FOR MACHINES

John L. Macdonald, Aurora, Ind., assignor to Cincinnati Incorporated, Cincinnati, Ohio

Filed May 12, 1971, Ser. No. 142,620

Int. Cl. G02f *1/28*

U.S. Cl. 317—124 **13 Claims**

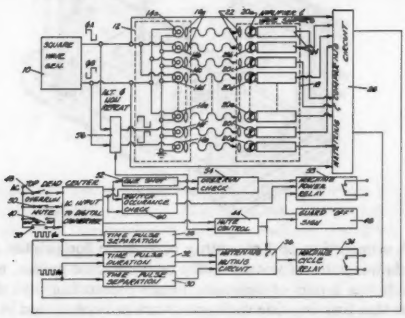


Photo-electric guard for machines, having a plurality of light sources and a corresponding plurality of photo-responsive devices. Each light source is powered by a modulated electric supply and is aimed at the corresponding one of the photo-responsive devices. The output of each photo-responsive device is reshaped and compared with the input to the light source, and any mismatch is effective to stop further machine operation.

3,704,397

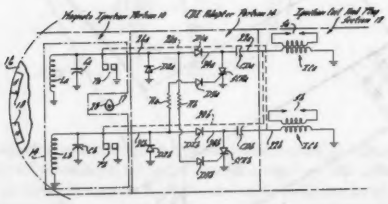
IGNITION ADAPTER CIRCUIT

Thomas J. Crouch, Leonard, Mich., and George E. Gynn, Fort Wayne, Ind., assignors to Syncro Corporation, Oxford, Mich.

Filed Dec. 13, 1971, Ser. No. 207,261

Int. Cl. F02p *3/06;* **H01t** *15/02*

U.S. Cl. 317—157.6 **6 Claims**



An electrical ignition system for adapting a conventional magneto spark ignition system to a capacitor discharge ignition system.

3,704,398

MULTI-EMITTER POWER TRANSISTOR HAVING EMITTER REGION ARRANGEMENT FOR ACHIEVING SUBSTANTIALLY UNIFORM EMITTER-BASE JUNCTION TEMPERATURES

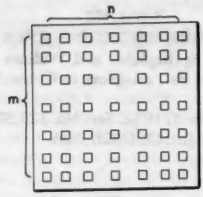
Katsushige Fukino, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1971, Ser. No. 114,169

Claims priority, application Japan, Feb. 14, 1970, 45/12453

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R **7 Claims**



A transistor having a plurality of divided emitter regions. The spacing between adjacent emitter regions at the central portion of the transistor is greater than that between adjacent peripheral emitter regions. This arrangement provides a more uniform distribution of junction temperatures. The structure finds particular utility in power transistors.

3,704,399

SEMICONDUCTOR DEVICE AND CIRCUIT ARRANGEMENT COMPRISING THE DEVICE

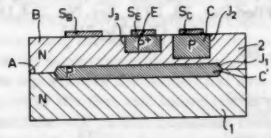
Rene Glaise, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed April 15, 1971, Ser. No. 134,342

Claims priority, application France, April 17, 1970, 7013973

Int. Cl. H01l *11/06*

U.S. Cl. 317—235 R **5 Claims**

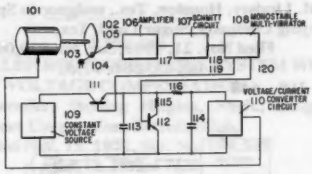


Semiconductor device comprising a semiconductor body having a base region of a first conductivity type and an emitter and collector region of a second conductivity type formed side by side in said base region and having like the latter contacts located on a face of said body, to which they are adjacent, characterized in that the device comprises at least one further region of the second conductivity type arranged near the collector and separated therefrom by the semiconductor material of the base region so that at a bias voltage at the collector-base junction exceeding a given threshold value the depletion zone of said junction attains said further region. The device has three stable states.

3,704,400
APPARATUS FOR CONTROLLING THE TENSION OF A MAGNETIC TAPE

Takeshi Goshima, and Yutaka Kohtani, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1970, Ser. No. 83,349
Claims priority, application Japan, Oct. 31, 1969, 44/87479
Int. Cl. H02r *7/28*
U.S. Cl. 318—6 **7 Claims**

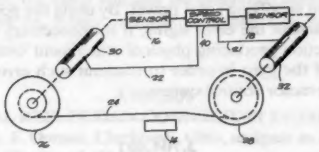


In order to transport a strip such as magnetic tape with a constant tension, the reel driving motor is driven by current flowing in proportion to the time required for one revolution of the motor or in inverse proportion to the number of revolutions of the motor. So that the transporting strip such as magnetic tape is maintained at a constant velocity and with a constant tension, and thus any variations in the level and frequency may be eliminated completely.

3,704,401
DUAL MOTOR CONTROL

Robert N. Miller, Dallas, Tex., assignor to International Computer Products, Inc., Addison, Tex.

Filed July 20, 1970, Ser. No. 56,545
Int. Cl. H02p *5/50*
U.S. Cl. 318—7 **16 Claims**

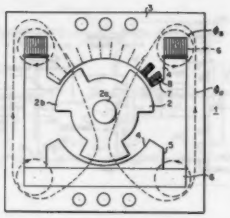


A dual motor drive system for synchronously controlling a first motor to drive a first reel and a second motor to drive a second reel to maintain a substantially constant, symmetrical linear velocity of material transferred between said reels as the diameter of the spools material varies as a non-linear function of the amount of material stored thereon. A reference signal is provided which is a function of a desired linear velocity of material transferred between the two reels. A summed signal is provided which varies as a function of the sum of the speeds of the first and second motors. The summed signal is compared with the reference signal to provide an error signal. The power supplied to the first motor driving the first of the two reels, which functions as a take-up reel, is controlled by the error signal, thereby controlling the speed of the motor. A smaller amount of power is supplied to the second motor associated with the second reel functioning as the supply reel to overcome inertia in the system and reduce the effects of coulomb resistance during starting and to provide braking action to maintain tension on the length of material extending between the two spools when running or stopping. Rate of movement of material between the two reels can be controlled or direction of movement reversed by changing the reference signal level or polarity respectively. Upon reduction of rate of movement or reversal, the second motor is driven to provide positive braking action or to change direction of movement as required with the previously driven first motor then operating as a brake.

3,704,402
SPEED CONTROLLED SYNCHRONOUS INVERTER MOTOR

Wilhelm Leitgeb, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Feb. 17, 1971, Ser. No. 116,105
Int. Cl. H02k *19/06*
U.S. Cl. 318—166 **1 Claim**

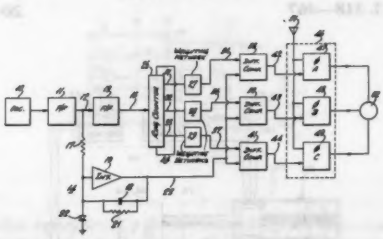


A speed controlled synchronous inverter motor is supplied from a multiphase alternating-current line of substantially constant frequency and voltage through rectifiers and inverters via a direct-current intermediate circuit. The motor is a medium-frequency machine whose armature winding and excitation winding are both located on the non-rotating part. The excitation winding is connected in series to the direct-current intermediate circuit and works also as a smoothing reactor.

3,704,403
POWER SUPPLY CIRCUIT TO SIMULTANEOUSLY VARY FREQUENCY AND AMPLITUDE IN A MOTOR SPEED CONTROL

Jimmie Douglas Gillett, Garland, Tex., assignor to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Feb. 23, 1972, Ser. No. 228,650
Int. Cl. H02p *5/28*
U.S. Cl. 318—227 **13 Claims**



A multiple pulse pulse-width modulation system is disclosed for controlling the speed of a standard three-phase induction motor or synchronous motor. An oscillator provides a clock signal which is divided down by a counting chain of two flip-flops to provide a first signal which is half the frequency of the clock signal and a second signal which is a quarter of the frequency of the clock signal. The first signal is integrated over the half cycles thereof while the second signal is applied to a digital wave form synthesizer which includes shift register stages and weighting resistors. The wave form synthesizer provides three output signals which are a stepwise approximation to a three-phase sine wave. Each of the three phases of the three-phase sine wave are applied to a differential comparator for comparison with the output of the integrator. The oscillator is variable in frequency so that the frequency of the three-phase sine wave and the amplitude of the integrator output can be varied thereby.

3,704,404
REGULATING MEANS

Kristen Iversen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Dec. 10, 1970, Ser. No. 96,719
Claims priority, application Germany, Dec. 17, 1969, P 19 63 228.1
Int. Cl. G05b *11/06*
U.S. Cl. 318—290 **4 Claims**

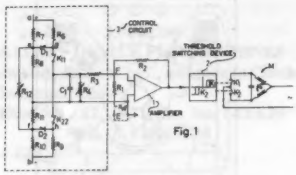


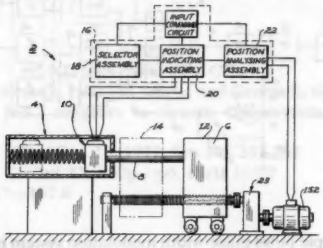
Fig. 1

The invention relates to a servomotor regulating unit having an adjustable proportional range. The servomotor is responsive to the output variable of the regulator which in turn is responsive to a sensed deviation voltage. An R-C unit in a an input circuit of the regulator has the charging voltage thereof switched on and off in synchronism with the switching on and off of the servometer. In known regulators the width of the proportional range and the amplification is adjusted by varying the charging voltage of the R-C unit with a potentiometer whereas in this invention they are adjusted independently of each other by limiting the voltage at the R-C unit to an adjustable value that is below the charging voltage and by making the charging time-constant of the R-C unit independent of this limiting value.

3,704,405
POSITIONING DEVICE

Earl D. Miller, Jr., Tallmadge, and Ronald J. Kindy, N. Canton, both of Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jan. 15, 1971, Ser. No. 106,852
Int. Cl. G05b *1/06*
U.S. Cl. 318—467 **20 Claims**

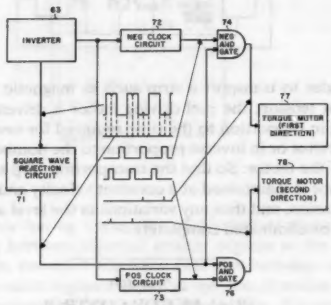


A system for controlling a drive mechanism to selectively move a work member from an existing position to a desired position. The system includes a probe-like sensing member adapted to engage and be moved by the work member. The sensing member is operably connected to a signalling mechanism adapted to produce an output signal related to the position of the work member. A position selecting assembly including at least one selector unit adapted to be selectively pre-set corresponding to a desired position and to produce an output signal related thereto. A position indicating assembly is operably connected to the signalling mechanism and the position selecting assembly being adapted to receive the respective output signals therefrom and produce a different signal related to the variation between the existing position to the desired position of the work member. A signal analyzing assembly is operably connected to the position indicating assembly for analyzing the output signal thereof and for producing an output signal to activate the drive mechanism in response thereto to move the work member from the existing position to the desired position.

3,704,406
GYRO SERVO CONTROL SYSTEM & STRUCTURE

James M. Lindsey, Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 21, 1969, Ser. No. 879,006
Int. Cl. B64c *17/02*
U.S. Cl. 318—648 **17 Claims**

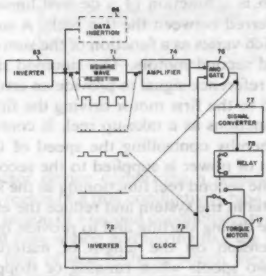


In a system for controlling the tilt of a rotor on a gyro, a sensing device for detecting tilt, together with electrical circuit components for providing an error signal are mounted upon the rotor housing. The error signal for providing a corrective signal to a torque motor control system is transmitted via a circuit supplying rotor power. By using the power supply path to transmit the error signal, it is unnecessary to use any sort of friction producing physical attachment with the components of the gyro in order to transmit such error signal to the torque motor control system.

3,704,407
GYRO SERVO CONTROL SYSTEM & STRUCTURE

James M. Lindsey, Houston, Tex., assignor to Sperry Sun Well Surveying Company, Sugar Land, Tex.

Filed Nov. 21, 1969, Ser. No. 879,007
Int. Cl. B64c *17/02*
U.S. Cl. 318—648 **12 Claims**



In a system for controlling the tilt of a rotor on a gyro, a sensing device for detecting tilt, together with electrical circuit components for providing an error signal are mounted upon the rotor housing. The error signal, which is transmitted

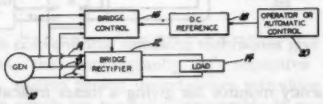
by the circuits supplying power to the gyro rotor, is supplied to a control system which in turn provides a signal to a torqueing motor. The torque motor is continuously operated, and normally rotates in a first direction unless a signal is received from the sensing device, which detects tilt in only one direction, whereupon the torque motor is reversed to apply a corrective force to the gyro system. Use of the power supply path to transmit the error signal obviates the use of any friction-producing physical attachment with the components of the gyro in order to transmit such error signal to the torque motor control system.

3,704,408

CONTROLLED RECTIFIER FIRING SYSTEM WITH VOLTAGE COMPENSATION

Thaddeus Schroeder, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1971, Ser. No. 198,545
Int. Cl. H02m *7/20*
U.S. Cl. 321—5 **3 Claims**



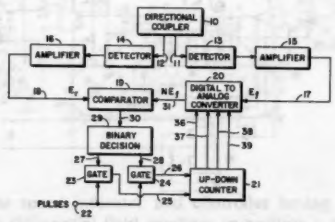
Firing angle control for controlled rectifiers in a bridge rectifier connected with an alternating voltage input is developed from control voltages derived from the alternating voltage input. In a three-phase system, each line-to-line voltage is used as a ramp in generating gate firing signals for an associated controlled rectifier in a respective line. To maintain the output at a constant voltage level, automatic compensation for voltage variations at the input is provided by modifying the ramp voltages to advance or retard the firing angle when the input is increased or decreased respectively: in one embodiment, the ramp voltages are combined with DC offset voltages and AC ripple voltages to compensate for voltage variations.

3,704,409

DIGITAL REFLECTION COEFFICIENT DETECTOR

Johannes A. F. Oomen, Cincinnati, Ohio, assignor to Avco Corporation, Cincinnati, Ohio

Filed May 24, 1971, Ser. No. 146,069
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 R **2 Claims**



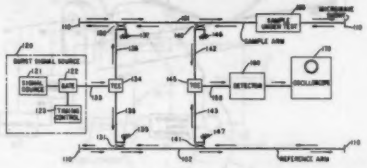
There are shown herein an apparatus and method for indicating and storing the modulus of the reflection coefficient in a radio frequency system. The apparatus makes use of voltages E_r and E_f. Voltage E_r is a measure of the power reflected back from the load. Voltage E_f is a measure of the forward power sent toward the load by the source. The analog quantities E_r and NE_f are applied to a comparator, the output of which is utilized to control an up-down counter which stores the quantity N, the modulus of the reflection coefficient. The up-down counter controls a digital to analog converter which utilizes the quantity E_f as a reference and produces the analog output NE_f.

3,704,410

BRIDGE CIRCUIT UTILIZING PULSE ECHO TECHNIQUE

Kevin Christopher O'Brien, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 29, 1971, Ser. No. 157,926
Int. Cl. G01r *27/04*
U.S. Cl. 324—58 A **10 Claims**



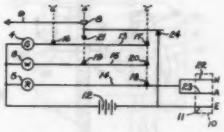
Sensitivity of a bridge circuit for measuring propagation characteristics of test samples is increased by employing a pulse-echo technique. The bridge includes sample and reference arms having substantially identical characteristics. Each of the bridge arms is arranged so that a single pulse signal is caused to propagate the length of each arm a plurality of times. The pulse signals are periodically sampled and compared to generate a difference signal. In turn, the difference signal is utilized to determine a characteristic of a test sample, for example, attenuation.

3,704,411

PORTABLE DEVICE FOR TESTING ELECTRICAL APPLIANCES

Ian K. Jamieson, 9 Kinkaid Road, Elizabeth East, Australia

Filed Aug. 14, 1970, Ser. No. 63,882
Claims priority, application Australia, Aug. 18, 1969, 59660; March 4, 1970, 0514
Int. Cl. G01r *31/02*
U.S. Cl. 324—53 **4 Claims**



A device operable as a torch or a testing device to test the circuitry of an electrical appliance for safety. The appliance is plugged into the device whereby the device can indicate the continuity of the earths connection of the appliance and also indicate and detect any leak between the windings of the appliance and its earth connection. The device can also be used to test its own indicators before being used as a test appliance.

3,704,412

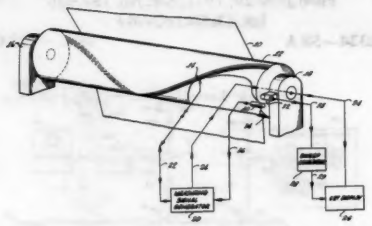
SCANNING IMPEDANCE MEASURING SYSTEM EMPLOYING A SPIRAL SENSING ELEMENT

John W. Lundstrom, Glendora, Calif., assignor to Moisture Register Company, Alhambra, Calif.

Filed Feb. 11, 1971, Ser. No. 114,659
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **10 Claims**

Apparatus for periodically scanning the impedance across a web of material and displaying the impedance variations. A sensing element having a pair of parallel, spaced metallic strips spirally mounted on the external surface of a carrier

cylinder is positioned across the web for minimal surface contact therewith. A small section of the width of the web is in surface contact with the spaced parallel strips and forms an impedance therebetween to be measured. The section of the



web being measured moves, in affect, across the web as the cylinder rotates. The measuring circuitry includes a periodically balanced impedance bridge circuit and a triggering mechanism for the measuring and display systems which generates simultaneous isolated trigger pulses.

3,704,413

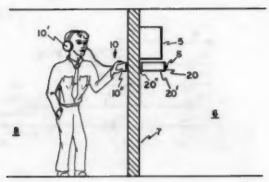
METHOD OF TRANSLATING THE LOCATION OF A PREDETERMINED POSITION ON ONE SIDE OF A SUBSTANTIALLY NONFERROUS STRUCTURAL BARRIER OF A BUILDING TO AN OPPOSITE SIDE OF SAID BARRIER

Maurice E. Blevins, 98 Canterbury Road, Spartanburg, S.C.

Filed Jan. 7, 1970, Ser. No. 1,100

Int. Cl. 340 *258 D;* **G01n** *27/00;* **G01r** *19/16, 33/00*

U.S. Cl. 324—67 **9 Claims**



A device and method for locating objects through a substantially nonferrous barrier, the use of which may also be applied for determining the thickness of such a barrier and for localized surveying. An audio oscillator serves as a transmitter which emits signals that are picked up by headphones connected to a resonant tuned circuit. The transmitter is placed on or adjacent an object to be located and is set to transmit. Signals from the transmitter may then be located by the headphones and the peak sound from the signal or a null in the signal may be detected to pinpoint the position of the transmitter on the opposite side of the barrier. Whether or not the peak sound or the null is detected depends upon the attitude of the transmitter coil with respect to the receiver coil. For measuring thickness of a particular barrier, the transmitter is located as stated above after which a null circle is detected radially out from the point where the transmitter was located. The distance between the point of location of the transmitter and the null circle is a function of the thickness of the barrier. Alternatively, the null circle diameter may be detected and used to determine barrier thickness.

3,704,414

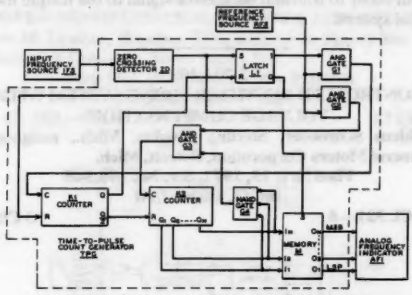
FREQUENCY METER

John A. Herbst, Morristown, N.J., assignor to Bogue Electric Manufacturing Company, Paterson, N.J.

Filed Jan. 18, 1971, Ser. No. 107,010

Int. Cl. G01r *23/14, 23/02*

U.S. Cl. 324—79 D **10 Claims**



A frequency monitor for giving a meter indication of the frequency of a signal utilizes a zero-crossing detector to control the counting of clock pulses to a pair of cascaded binary counters. The first counter covers the bulk of the period between zero crossings and the second counter covers the remainder thereof. The count in the second counter is periodically stored and fed to a digital-to-analog converter which includes means for performing an analog linearization of currents which energize a meter; such meter being calibrated in Hertz per unit current.

3,704,415

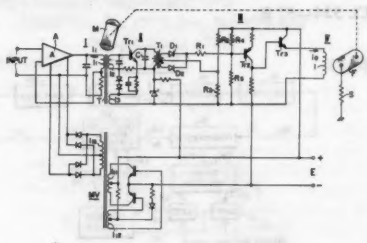
AUTOMATIC BALANCING MEASURING METER

Takashi Yamanaka; Rinichi Miyauchi; Hisaya Fujita, and Nobuo Kaieda, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed April 2, 1970, Ser. No. 25,023

Int. Cl. G01r *17/06, 33/00*

U.S. Cl. 324—99 R **4 Claims**



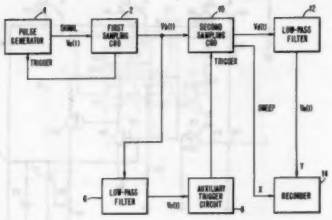
An automatic balancing measuring meter is comprised by a magnetic core including an input, an output and a positive feedback windings wound thereon, a movable magnet providing a magnetic flux corresponding to the angle of rotation thereof, an amplifier including a tuning circuit connected to the output winding, a feedback circuit to apply a portion of the output from the amplifier to the positive feedback winding, a detector to detect the output from the amplifier, and torque generating means energized by the detector to drive the movable magnet to cause the flux produced by the movable magnet to balance with the flux produced by the input winding.

3,704,416

SEQUENTIAL SAMPLING SYSTEM

Brian J. Elliott, New York, and John L. Staples, Tarrytown, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 13, 1970, Ser. No. 54,182
Int. Cl. G01r *13/20*; H03k *17/00*
U.S. Cl. 324—121 R 3 Claims



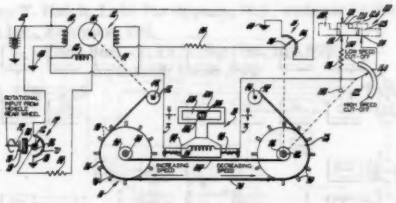
Although conventional sampling techniques give minimum risetime in the oscillography of repetitive electrical waveforms, system timing uncertainties introduce drift and jitter errors which are typically comparable in magnitude to the cathode ray oscilloscope risetime. By using two sampling oscilloscopes in cascade and in conjunction with special triggering methods, it is possible to reduce the drift by a factor of 10^{-3} down to a level of less than 10^{-14} sec./minute. The use of two sampling oscilloscopes in cascade thereby allows highly effective jitter filtering with the result that the new system has greatly improved accuracy in portraying the waveforms of very fast electrical phenomena.

3,704,417

VEHICLE SPEED INDICATOR

Judson S. Davis, Davidson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 1,422, Jan. 8, 1970, Pat. No. 3,635,306.
This application July 22, 1971, Ser. No. 165,192
Int. Cl. G01p *3/52*
U.S. Cl. 324—163 4 Claims



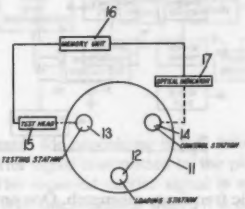
A vehicle speed indicator and controller having a drive motor with differential field windings to position a constant force extension spring between two pulleys to indicate the vehicle speed. A potentiometer supplies a signal corresponding to vehicle speed to one of the differential field windings to cause rotation of the drive motor output shaft. Another potentiometer supplies a signal corresponding to the position of the constant force extension spring to the remaining differential field winding to stop rotation of the drive motor output shaft. The speed controller has a tape having magnetic properties positioned by the speed indicator. At the control speed, an electro-magnet is energized to attach to the tape which in turn transfers movement of the speed indicator to a power unit to control a vehicle throttle.

3,704,418

TESTING OF SEMI-CONDUCTOR DEVICES

George Coffin, Streetly, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 11, 1970, Ser. No. 62,970
Claims priority, application Great Britain, Aug. 11, 1969, 40,006/69
Int. Cl. G01r *31/26*, *15/12*
U.S. Cl. 324—158 F 1 Claim



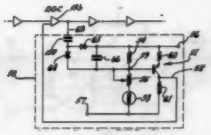
A method of testing a plurality of semi-conductor devices simultaneously in which the devices are placed in a testing station, at which point each device is tested and the information is stored in a memory unit, the devices then being moved to a control station, and while a second set of devices are being tested at the testing station, the memory unit operating so that an observer sees at the control station a spot of light for each faulty device, so that the faulty devices can be readily marked.

3,704,419

AUTOMATIC COMPENSATION OF CABLE TELEVISION SYSTEMS

William A. Rheinfelder, South Laguna, Calif., assignor to Anaconda Astrodata Co., Anaheim, Calif.

Continuation of Ser. No. 560,696, June 27, 1966, abandoned.
This application Jan. 14, 1971, Ser. No. 106,400
Int. Cl. H04b *1/06*
U.S. Cl. 325—308 6 Claims



The invention concerns a cable television system wherein provision is made for effective automatic compensation for signal attenuation due to system temperature change, as for example in spaced AGC amplifiers.

3,704,420

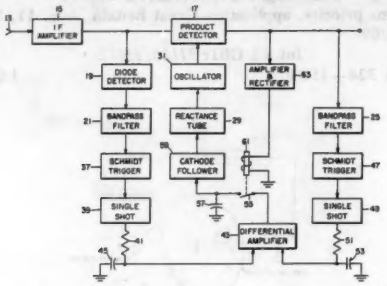
AUTOMATIC FREQUENCY CONTROL FOR SUPPRESSED CARRIER RECEIVERS

Oswald G. Villard, Jr., Woodside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 20, 1970, Ser. No. 56,594
Int. Cl. H04b *1/68*
U.S. Cl. 325—329 2 Claims

An automatic frequency control circuit for receivers of suppressed carrier SSB voice signals. First, the incoming signals are rectified in a conventional AM diode detector. The audio output, for vowels and voiced sounds, will consist primarily of the fundamental and harmonics of the vocal cord vibrations. This harmonic spectrum is then compared with the analogous voice harmonics at the output of a product detector. If the compared voice harmonics are mismatched in audio frequen-

cy, then an error signal is generated which is used to adjust the frequency of the locally generated carrier signal which is injected into the product detector. Frequency adjustment will continue until the error signal approaches zero and there is no



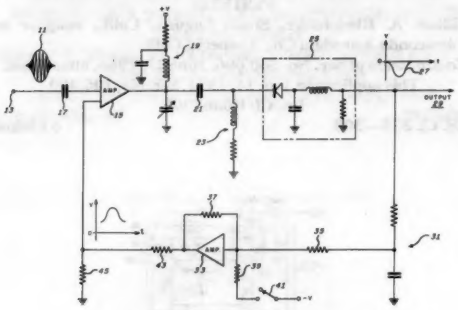
voice harmonic frequency mismatch. One embodiment of the present invention employs a phase comparison of the voice harmonics and another embodiment employs a frequency comparison of the voice harmonics.

3,704,421

PULSE-TO-PULSE INSTANTANEOUS AUTOMATIC GAIN CONTROL CIRCUIT

Henry R. Blane, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Dec. 31, 1970, Ser. No. 103,083
Int. Cl. H04b *1/16*
U.S. Cl. 325—408 **5 Claims**



The output signal of an intermediate frequency amplifier is applied to a load through a video detector. An operational amplifier is arranged in a feedback loop so that the signal from the operational amplifier is used to control the gain of the intermediate frequency amplifier. A d.c. bias voltage is applied to the operational amplifier so that the gain control signal applied to the intermediate frequency amplifier represents the combination of the bias voltage and the instantaneous voltage from the video detector. The bias voltage is adjusted so that the intermediate frequency amplifier produces maximum gain so long as the voltage from the video detector remains below a specified value and reduced gain whenever the voltage from the detector exceeds the specified value.

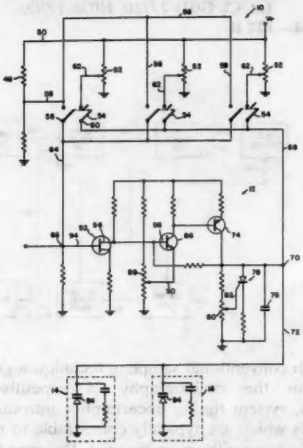
3,704,422

FREQUENCY LOCK-IN PRESET TUNING SYSTEM

Roger B. Thomson, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Dec. 18, 1970, Ser. No. 99,396
Int. Cl. H04b *1/16*
U.S. Cl. 325—422 **5 Claims**

A preset tuning system has a search tuning system with varactor tuning means coupled to its output. Switch means, when closed, connects the input of the search tuning means to a voltage source so as to apply to the input a voltage sufficient to hold the search tuning circuit in a state of equilibrium. The switch means, when closed, also connects a control voltage source to the varactor tuning means and to the output of the



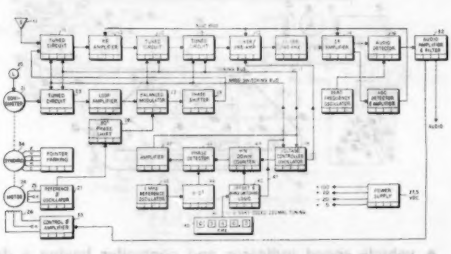
search tuning circuit which serves to coincidentally control the voltage on the output of the search tuning circuit and the varactor tuning means while the switch means is closed. When the switch means is then opened, the search tuning circuit will immediately lock on the center of the incoming signal, whereby the voltage on its output is maintained.

3,704,423

ADF WITH REMOTE DIGITAL TUNING

Stanley F. Kadron, Lighthouse Point; Gary L. Eisenhauser, Ft. Lauderdale; David J. Pryor, Ft. Lauderdale, and Raul J. Chacon, Ft. Lauderdale, all of Fla., assignors to The Bendix Corporation

Filed Nov. 23, 1970, Ser. No. 92,101
Int. Cl. H04b *1/16*
U.S. Cl. 325—458 **18 Claims**



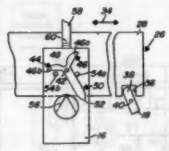
A remotely controlled digitally tuned receiver for automatic direction finders wherein a decimal frequency selector switch provides digitally coded signals controlling the tuning of the receiver. The selector switch may be located at a distance from the receiver and connected thereto by wires carrying the coded decimal signal. Logic circuits within the receiver respond to the coded decimal signals to effect bandswitching and to control the frequency of a synthesizer serving as a local oscillator. The synthesizer includes a voltage controlled oscillator, the control voltage of which also controls the tuning of resonant circuits selected by the bandswitch.

3,704,424

MULTI-BAND MEMORY ASSEMBLY

Jack C. Fiore, Chicago, and M. Richard Tennerstedt, Wilmette, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 19, 1971, Ser. No. 173,165
Int. Cl. H04b 1/16
U.S. Cl. 325—470 6 Claims



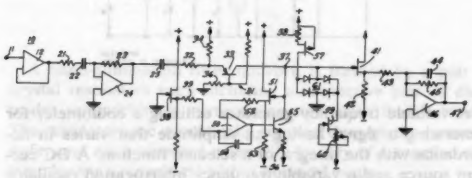
A waveband memory assembly in a dual band radio receiver includes a plurality of memory tabs mounted for pivotal movement on a slide plate; the latter being movable sidewise to two positions representing two radio waveband settings. Each memory tab is associated with a pushbutton selector, and includes a pair of wing-like projections extending outwardly from one end thereof and an elongated leg portion extending outwardly in the direction generally opposite thereto. Each of the memory tabs is pivotal to two positions representing the two waveband settings. Inward movement of the pushbutton moves a guide member depending therefrom into engagement with the elongated leg portion of a corresponding memory tab to move the slide plate to a position corresponding to that of the memory tab. Withdrawal of the pushbutton moves a finger-like projection on the pushbutton into engagement with the wing-like projections and ultimately into a recess therebetween. Subsequent thereto, the slide plate may be moved to a desired waveband setting. The memory tab is pivoted to the selected setting in accordance with the movement of the slide plate while the finger-like projection remains in the recess.

3,704,425

COMPRESSION/EXPANSION TECHNIQUES FOR TIME VARYING SIGNALS

Geoffrey T. Haigh, Lake Parsippany, N.J., assignor to Particle Data Inc., Elmhurst, Del.

Filed June 21, 1971, Ser. No. 154,800
Int. Cl. H03b 3/02
U.S. Cl. 328—145 7 Claims



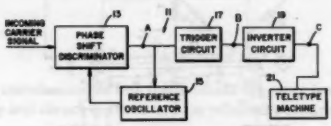
A signal translation circuit includes a buffer amplifier which feeds a differentiator to provide for a signal $f(t)$, the function $d f(t)$ to present to a bipolar AC log amplifier to change the waveform to log $[d f(t)/dt$. An integrator is then provided to restore the signal to its input waveform and at an amplitude which is the log of the amplitude of the original waveform.

3,704,426

PHASE LOCKED DETECTOR SYSTEM

William C. Smith, 67 Cuesta Vista Drive, Monterey, Calif., and James A. Rauth, 5172 Tripoli Avenue, Los Alamitos, Calif.

Filed March 22, 1971, Ser. No. 126,760
Int. Cl. H03d 3/24
U.S. Cl. 329—122 4 Claims



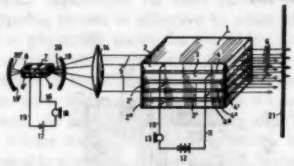
A detector system for processing binary information contained in the carrier signal transmitted by the phase shift keying technique. The received carrier signal is applied to the input of a phase shift discriminator where it is compared with the output signal of a reference oscillator. The phase shift discriminator provides a D.C. output signal the level of which is dependent upon the out of phase relationship between the carrier signal and the reference signal. The reference oscillator is responsive to this D.C. signal and is initially frequency locked to the carrier signal and then phase locked to the carrier signal. The binary information is also contained in the level of the D.C. signal and is applied to a binary signal response device such as a teletype machine.

3,704,427

DEVICE FOR STIMULATING EMISSION OF RADIATION FROM A DIODE

Walter Heywang, Munich, Germany, assignor to Siemens & Halske Aktiengesellschaft, Berlin, Germany

Filed June 3, 1964, Ser. No. 372,199
Claims priority, application Germany, June 7, 1963, S 85580
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 23 Claims



A device for stimulated emission of radiation utilizes a semiconductor body having a plurality of transition layers of i conductivity type parallel to each other and having opposite edges. When the body is electrically excited to stimulate radiation by charge-carrier in the layers and radiation is applied to one corresponding edge of the layers, amplified coherent tightly bunched beams are emitted by the transition layers at the other corresponding edge thereof.

3,704,428

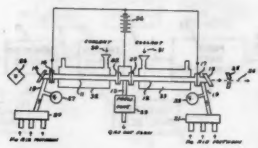
CARBON MONOXIDE LASER FROM HELIUM-AIR-METHANE MIXTURE

James D. Barry, and William E. Boney, III, both of Fairborn, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 4, 1971, Ser. No. 186,334
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 8 Claims

A gas laser charged with a mixture of helium-air-methane, operable in both the Q-switched and CW mode, forms vibrationally excited CO molecules by the electric discharge in-

duced chemical oxidation of methane. The resulting laser output provides at least 80 laser emission lines in the region from 4.7848 to 5.8532 microns, with 20 lines below 5 microns. Multiline pulse powers greater than two kilowatts may be obtained from the molecules formed by the electrochemical reaction. The lines result from $P(J)_{v,v'}$ vibration-rotational



transitions in the formed CO with J ranging from 10 to 15 nominally and v,v' ranging from 2:1 to 16:15. Simultaneous lasing of both the formed CO and CO_2 molecules may be obtained by using two different temperatures of cooling (approximately −200°C for one portion of the tube and approximately −80°C for the remainder) of the laser tube to provide additional emission lines in the 9 to 13 micron range.

ERRATUM

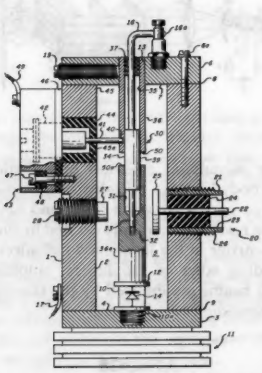
For Class 331—94.5 D see:
Patent No. 3,704,377

3,704,429

NEGATIVE RESISTANCE DIODE COAXIAL CAVITY OSCILLATOR WITH RESISTOR FOR SUPPRESSING UNDESIRED MODES

Bernard E. Sigmon, Tampa, Fla., assignor to Sperry Rand Corporation

Filed June 19, 1970, Ser. No. 49,439
Int. Cl. H03b 7/14; H03f 3/10
U.S. Cl. 331—101 **4 Claims**



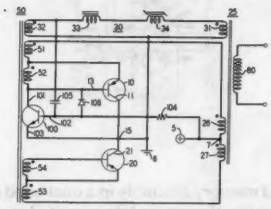
A negative resistance diode device is coupled to oscillating high frequency fields within a coaxial line cavity resonator for amplifying those electromagnetic fields. The combination forms a single port, high frequency amplifier or oscillator. A resistive device is coupled within the inner conductor of the coaxial resonator for supplying bias to the negative resistance diode device, for eliminating spurious modes of high frequency oscillation in the resonator, and for facilitating electronic tuning of the operating high frequency of the converter.

3,704,430

STARTING CIRCUIT FOR LOW VOLTAGE INVERTERS UTILIZING REGENERATIVE ACTION IN THE FEEDBACK TRANSFORMER OF THE INVERTER TO GENERATE STARTING SIGNALS

George Raymond Westerman, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 23, 1971, Ser. No. 155,710
Int. Cl. H02m 7/52
U.S. Cl. 331—113 A **1 Claim**



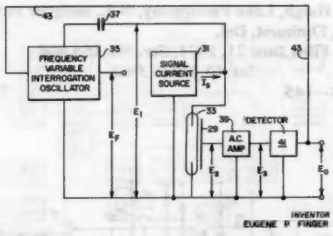
A starting circuit for a low input voltage current feedback type inverter utilizes regenerative action in the windings of its feedback transformer to drive a transistor in order to generate starting oscillatory signals. These starting oscillatory signals are utilized to drive one of the switching transistors of the inverter into a conduction state, whereupon inverter action is started. An inhibiting feedback arrangement inhibits the starting oscillatory signals after the inverter circuit starts to oscillate.

3,704,431

COULOMETER CONTROLLED VARIABLE FREQUENCY GENERATOR

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed July 21, 1971, Ser. No. 164,677
Int. Cl. H03b 3/00
U.S. Cl. 331—177 R **6 Claims**

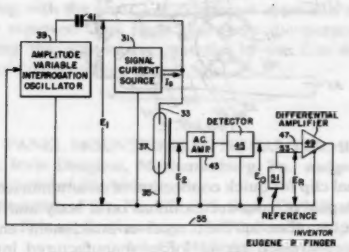


A variable frequency generator utilizing a coulometer for generating a signal having an amplitude that varies in accordance with the integral of a selected function. A DC current source and a variable frequency interrogation oscillator are connected to the input terminals of a coulometer which modulates the output of the oscillator in accordance with the integral of the current from the current source. The output of the coulometer is amplified by an AC amplifier and is then demodulated by a standard envelope detector. The demodulated signal is fed back to the oscillator to proportionally control the frequency of the oscillator, that is, as the amplitude of the modulated signal increases, the frequency of the oscillator increases and, as the amplitude of the demodulated signal decreases, the frequency of the oscillator decreases.

3,704,432
CAPACITIVE COULOMETER IMPROVEMENTS

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed July 21, 1971, Ser. No. 164,676
Int. Cl. H03b *3/02*
U.S. Cl. 331—183 **7 Claims**

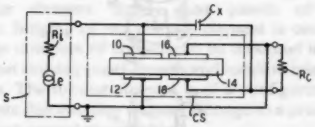


A generator utilizing a capacitive coulometer for generating a signal that is inversely proportional to the integral of a selected function. A current source and a variable amplitude interrogation oscillator are connected to the input terminals of a coulometer which modulates the output of the oscillator in accordance with the integral of the current from the current source. The modulated signal is amplified in an AC amplifier and demodulated by a standard envelope detector. The demodulated signal is compared with a reference signal in a differential amplifier which generates an error output signal when the demodulated signal is not equal to the reference signal. The error signal is fed back in a negative feedback path to adjust the amplitude of the variable amplitude interrogation oscillator.

3,704,433
BAND-ELIMINATION FILTER

Jedediah Lyman Garrison, Andover, and Andrew Nicholas Georgiades, Lowell, both of Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 847,544, Aug. 5, 1969, abandoned. This application May 27, 1971, Ser. No. 147,681
Int. Cl. H03h *9/00*
U.S. Cl. 333—72 **15 Claims**



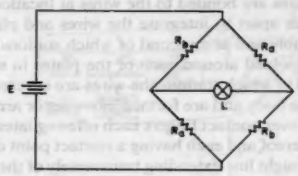
A band-elimination filter network is formed by a pair of crystal resonators each including a respective pair of electrodes sandwiching a common crystal wafer therebetween. The resonators are acoustically coupled through the common wafer and are connected externally by way of a reactive element having a magnitude within a critical range.

3,704,434
SKIN EFFECT RF BRIDGE FILTER

Donald A. Schlachter, 222 Braehead Drive, Fredericksburg, Va.

Filed April 20, 1971, Ser. No. 135,731
Int. Cl. H03h *7/10, 9/00*
U.S. Cl. 333—75 **15 Claims**

A filter in a bridge configuration having different types of iron coated conductors. The device excludes current from a load by utilizing the skin effect to attenuate RF energy. The

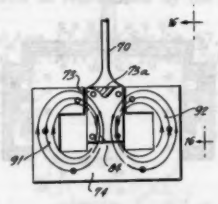


bridge is unbalanced at low frequencies allowing low frequency energy and direct current to pass relatively unhindered.

3,704,435
TRIPPING SYSTEM FOR CIRCUIT BREAKER

Frank W. Kussy, Haverford, and Gustave E. Heberlein, Jr., King of Prussia, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Division of Ser. No. 145,175, May 20, 1971, Pat. No. 3,663,903. This application Dec. 20, 1971, Ser. No. 209,853
Int. Cl. H01h *3/32*
U.S. Cl. 335—255 **3 Claims**

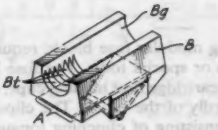


A current limiting circuit breaker is constructed to achieve more rapid tripping in the medium fault current range by utilizing a magnetic tripping device which imparts physical motion to the movable contact under particular fault current conditions. In the lowest fault current range above the thermal tripping range the magnetic tripping unit automatically operates or releases the spring operating mechanism thereby causing contact separation. As fault current increases the magnetic tripping means is effective to assist the operating mechanism to physically move the movable contact, and at still higher currents the magnetic tripping means moves the movable contact to its fully open position before any movement is imparted to the movable contact by the spring operating mechanism. As fault currents increase still further, electrodynamic forces assist the magnetic means to physically move the movable contacts, and in the very highest fault current range electrodynamic operation moves the movable contact essentially to its fully opened position, before the magnetic trip means for the operating mechanism is active in moving the movable contact.

3,704,436
MULTI-WIRE POTENTIOMETER CONTACT DEVICE

Ronald L. Froebe, and Howard H. Hatch, both of Riverside, Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Feb. 24, 1971, Ser. No. 118,246
Int. Cl. H01c *9/02*
U.S. Cl. 338—202 **4 Claims**



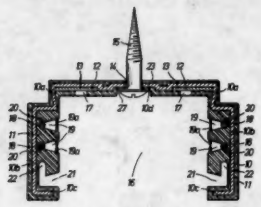
A contact device for potentiometers and method of producing the device, the device being devised and arranged to

facilitate automatic manufacture thereof by a machine into which a strip-like sheet or array of fine-gauge wires is drawn in side-by-side relation under tension past stations at a first of which flat plates are bonded to the wires at locations at measured intervals apart to integrate the wires and plates into a unitary assembly and at a second of which stations an insulative body is molded around each of the plates in succession, and at a third of which stations the wires are severed adjacent one end of the body and are formed into a set or array of side-by-side cantilever contact fingers each offering lateral support to another thereof and each having a contact point disposed in a common straight line extending transversely of the fingers.

3,704,437
CURRENT DISTRIBUTOR RAIL

Kurt Hesse, Lemgo-Lippe, Germany, assignor to Staff & Schwarz G.m.b.H., Lemgo-Lippe, Germany

Filed Jan. 5, 1971, Ser. No. 104,104
Claims priority, application Germany, Jan. 7, 1970, A 126/70
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **7 Claims**

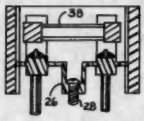


A current distributor rail for supplying current to consuming devices, comprising a C-section metal base extending over the entire length of the rail and a plastic covering enclosing the metal base. A plurality of power conductors embedded in the plastic covering, with an access opening for each conductor defined by the covering and extending over the entire length of the rail. A least one ground conductor in contact with the metal base and accessible from the interior of the rail through recesses in the plastic covering, and two locating grooves extending over the entire length of the rail defined by the plastic covering and accessible from the interior of the rail. The locating grooves having clamping surfaces to receive an adaptor.

3,704,438
SCREWLESS TERMINAL FUSE BOX

Christopher B. Boone, 926 Brunswick Court, Rockledge, Fla.

Division of Ser. No. 836,192, May 23, 1969, Pat. No. 3,555,481. This application Aug. 2, 1971, Ser. No. 168,070
Int. Cl. H01r *9/12*
U.S. Cl. 339—95 D **4 Claims**

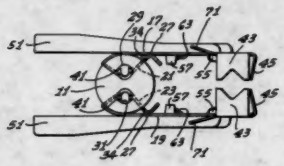


A quick wiring modular fuse block, requiring no soldering crimping screws or special tools. The fuse block comprise a pair of wire and cartridge fuse holding clips, of springy material secured inwardly of the block. The clips are formed with wire grippers consisting of clinching tongues, die cut in the base of the clips. The base of the housing is formed with wireway bores aligned with the wire grippers for passing the wire ends therethrough.

3,704,439
TERMINAL CLIP

Arthur Nelson, 1069 Via Regina, Santa Barbara, Calif.

Filed Oct. 15, 1970, Ser. No. 81,088
Int. Cl. H01n *11/20*
U.S. Cl. 339—99 R **12 Claims**

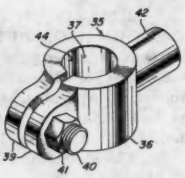


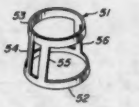
A terminal clip for quick connection of an antenna lead to a receiver. A pair of jaws are mounted on a body and biased toward one another at their receiver-attachment ends by means of pre-stressed spring forces manufactured into the jaws in the areas in which they are attached to the body. An operating handle is attached to each jaw for opening them so that they can grip the receiver elements between them. Portions of the jaws within the body are provided with teeth whereby, when an antenna lead is threaded through the body, a screw means may be moved toward the teeth to fixedly embed the conductors thereon.

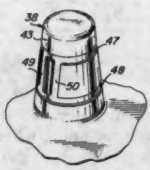
3,704,440
CORROSION RESISTANT BATTERY TERMINAL CONNECTOR

Curtis E. Bradley, 4517 Calle Ventura, Phoenix, Ariz.

Continuation-in-part of Ser. No. 47,384, June 18, 1970, abandoned. This application Dec. 2, 1970, Ser. No. 94,286
Int. Cl. H01r *11/26*
U.S. Cl. 339—114 **5 Claims**







A corrosion resistant battery terminal connector for attaching an electrical conductor cable to a terminal post in an electric storage battery. An elastomeric material sealingly engaged between the outside surface of the battery terminal post and the bore of the cable terminal is used to define corrosion resistant areas by electrical contact which are protected from corrosion by air and moisture. One embodiment employs a circular cable terminal having inwardly projecting battery post contacting flanges enclosed by a gasket or elastomeric material. An alternate embodiment employs a conventional cable terminal and a battery terminal post having recesses to receive

the elastomeric gasket. A fastener fits around the battery post and cable terminal. The fastener has two rings which are slightly larger than the terminal post. The rings are connected to each other and the top and bottom ring is elastically fixed to an angle so as to eliptically engage the terminal connector to the post. A second connecting piece joined only at the bottom ring extends upwardly. The second connecting piece serves to pull the bottom ring into a perpendicular position relative the battery post relieving the pressure of the eliptical contact of the ring with the post. The connector apparatus can then be easily removed. The rings also serve the purpose of compressing the elastomeric material in the first embodiment thereof thus providing a firmer seal.

3,704,441

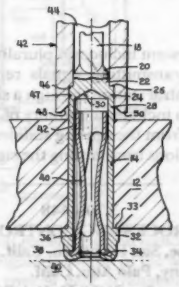
PANEL MOUNTED ELECTRICAL TERMINAL

Frank Irvin Douglass, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 756,809, Sept. 3, 1968, abandoned. This application Aug. 3, 1970, Ser. No. 64,139

Int. Cl. H01r 9/08

U.S. Cl. 339—220 T **4 Claims**



A method and article for mounting electrical contacts in a panel is disclosed which features a headed metal tubular element carrying a spring contact adapted to be inserted in an aperture of a panel. The tubular portion of the element is dimensioned to be symmetrically compressed longitudinally by tooling to develop an outward annular bulge capable of locking the element tightly into panels of different thicknesses. Bulging of the contact element is controlled to permit large numbers of contacts to be mounted in a plastic panel without causing panel growth and incident misalignment of elements. The tubular element is of a configuration to assure adequate deformation without damage to a preassembled spring contact carried therewithin.

3,704,442

HEIGHT SENSOR FOR HYDROFOIL WATERCRAFT

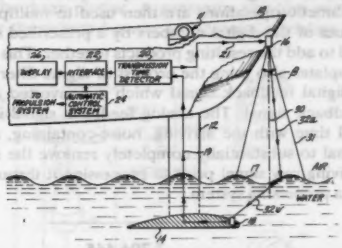
Charles P. Wright, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed April 20, 1970, Ser. No. 30,049

Int. Cl. G01s 9/68

U.S. Cl. 340—1 L **9 Claims**

A method for detecting the relative position of a gaseous-liquid interface with respect to a datum point and an apparatus embodying the same for use in hydrofoil height sensors. A transmitter situated on the watercraft's hull directs an ultrasonic signal at the water surface. A portion of that signal is transmitted through the surface and refracted thereby to an ultrasonic receiver preferably situated on the hydrofoil. Evaluation of the transmission time of the ultrasonic signal from the transmitter to the receiver yields significant information concerning the relative position of the water surface with respect to either the hull or the hydrofoil. Factors for successful implementation of this technique are discussed in detail, and reference is made to a specific embodiment of a detector for transmission times.



3,704,443

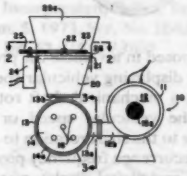
HYDRODYNAMIC TRANSDUCER

Edgar N. Rosenberg, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 27, 1970, Ser. No. 67,460

Int. Cl. G01v 1/00; H04b 13/00

U.S. Cl. 340—8 R **2 Claims**



A motor pump impels a substantial volume of water through a rotatable, slotted shutter to modulate the flow of impelled water. A pair of oppositely facing, radiating-piston surfaces is reciprocably displaced in response to the modulated flow to project acoustic energy through a water media. The transducer, by being freely flooded, in independent of changing pressures in the surrounding media and does not require elaborate sealing assemblies, making it ideal for operation at extreme depths. Varying the configuration of the shutter, interconnecting conduits, and varying the angular speed of the shutter afford selective broadband operation, and increasing the flow rate provides a greatly increased power output.

3,704,444

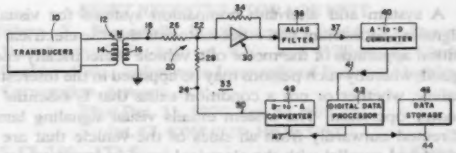
SEISMIC DATA PROCESSING METHOD AND SYSTEM

Arthur N. Schmitt, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed June 1, 1970, Ser. No. 42,347

Int. Cl. G01v 1/24, 1/30

U.S. Cl. 340—15.5 DP **8 Claims**



In a digital seismic data processing system the reflected seismic signals are received in analog form. An analog-to-

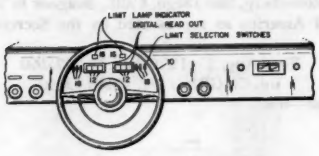
digital converter samples or measures at equal time intervals the analog signals and converts the sampled signals into a sequence of digital numbers. By the process of digital filtering, arithmetic operations are then used to multiply consecutive values of the digital numbers by a prescribed set of numbers and to add the resulting products together. This invention contemplates also using the process of digital filtering to produce a digital feedback signal which is converted into an analog feedback signal. The analog feedback signal is combined in real time with the arriving, noise-containing, analog seismic signal to substantially completely remove the noise from the arriving raw signal prior to processing it through the seismic data processing system.

3,704,445

DIGITAL READ OUT INDICATOR FOR VEHICLES

Richard R. Lanham, 904 Middleborough Road, Baltimore, Md.

Filed July 20, 1971, Ser. No. 164,294
Int. Cl. G08b *21/00;* **B60q** *1/54*
U.S. Cl. 340—62 **5 Claims**



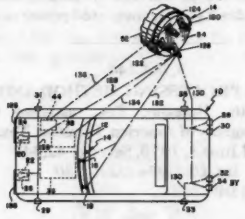
Apparatus disposed in a vehicle for providing a digital read out indicator for displaying vehicular speed or engine revolutions comprising a mechanical shaft rotated at a speed corresponding to the vehicular speed or engine revolutions, means responsive to the shaft rotation to produce an electrical pulse train at a recurrence frequency proportional to the shaft rotational speed, and digital display means responsive to said pulse train to produce the desired display.

3,704,446

RUNNING LIGHTS AND DIFFERENTIAL PARKING SYSTEMS FOR VEHICLES

Vincent J. Walter, 1557 Woodland Avenue, Wichita, Kans.

Filed Feb. 9, 1970, Ser. No. 9,838
Int. Cl. B60q *1/26*
U.S. Cl. 340—74 **28 Claims**



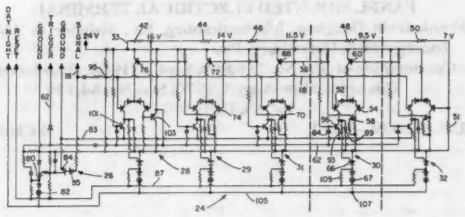
A system and alternate companion systems for visually signaling pedestrians and other motorists that the electrical ignition apparatus of the motor of a vehicle is electrically energized, whereby such persons may be apprised in the interest of safety, whether or not a condition exists that is essential to motor operation. The system entails visual signaling lamps directed outwardly from all sides of the vehicle that are in electrical parallel with the electrical ignition apparatus, voltage regulator or alternator, so as to be concurrently energized therewith. The system optionally includes means for interrupting energization of the electrical ignition apparatus and the lamps immediately prior to and after rotating the motor for starting purposes, such means preferably being incorporated in a conventional multipurpose so-called "ignition switch" and operative to burnish an electrical contact of the latter during an actuating movement thereof.

3,704,447

REMOTE TO CENTRAL MONITORING SYSTEM UTILIZING AMPLITUDE CODING OF SIGNALS

Charles T. Reader, 402 Ivystone Lane, Moorestown, N.J., and John F. Renz, 146 Harding Avenue, Cinnaminson, N.J.

Filed March 1, 1971, Ser. No. 119,486
Int. Cl. G08b *25/00;* **H04q** *5/14*
U.S. Cl. 340—172 **15 Claims**



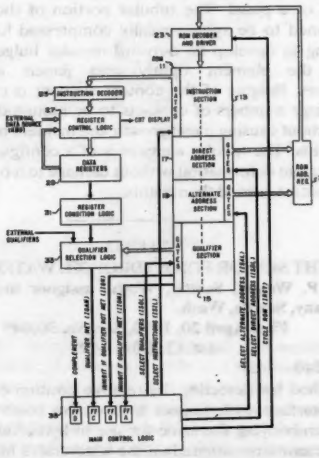
A monitoring system includes a plurality of sensing stations for sensing and transmitting signals representing abnormal conditions to a central station through a single channel or line. The central station includes a plurality of detectors responsive to receive signals from the sensing stations and to identify one or more of the stations transmitting the signals.

3,704,448

DATA PROCESSING CONTROL SYSTEM

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 769,034, Oct. 21, 1968, abandoned. This application Aug. 2, 1971, Ser. No. 168,472
Int. Cl. G06f *9/20, 13/08;* **G05b** *13/02*
U.S. Cl. 340—172.5 **7 Claims**



A read-only memory includes an instruction section, an address section, and a qualifier section, all of which are addressed simultaneously by a single memory address code and thereafter selectively enabled. A plurality of instructions from the instruction section simultaneously operate on data con-

tained in different storage registers. Qualifier logic compares the data in the storage registers with predetermined conditions addressed in the qualifier section. Different control codes are produced by the qualifier logic and qualifier section of the memory. Main control logic responds to the control codes and gates signals from the instruction and address sections. Instructions from the instruction section may be selectively inhibited.

3,704,449

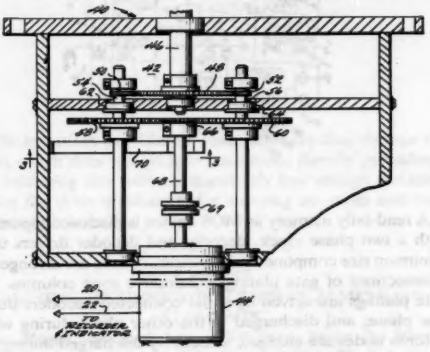
APPARATUS FOR MEASURING AND INDICATING THE ANGULAR POSITION OF AN ANTENNA

Samuel F. Hutchins, 1744 Rosalind Dr. N.E., Atlanta, Ga.

Continuation of Ser. No. 649,537, June 28, 1967, abandoned. This application Aug. 17, 1970, Ser. No. 64,605

Int. Cl. F16h *57/00;* **G08c** *19/00*

U.S. Cl. 340—198 **6 Claims**



An antenna position measuring and indicating system is disclosed wherein the angular position of the antenna is mechanically amplified by a special gear arrangement in order to increase the resolution of the angular indication and to decrease the electrical error of a synchro transmitter. The synchro converts the amplified mechanical indication to an electrical position signal which is transmitted to position indicating apparatus.

The gear arrangement steps up or amplifies the angular position of the antenna — that is, for each revolution of the shaft connected to the antenna, the shaft connected to the synchro transmitter undergoes a plurality of revolutions. A first gear is attached to the shaft connected to the antenna and another gear is attached to the shaft connected to the synchro. Two intermediate shafts with gears at both ends of each shaft are also provided. The last-mentioned gears mesh with opposite sides of the gears associated with the antenna and synchro. Thus, any eccentricity of the gear associated with the antenna is averaged out so that the angular position of the shaft connected to the synchro is an accurate amplification of the true angular position of the shaft connected to the antenna. Hence, the combined mechanical error (due to the gear arrangement) and electrical error (due to the synchro) is substantially minimized.

3,704,450

SEISMIC TRACE CENTER-LINE GENERATOR

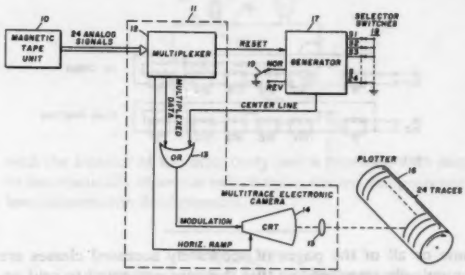
Clarence G. Smith, Irving, Tex., assignor to Mobil Oil Corporation

Filed July 26, 1971, Ser. No. 166,167

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **5 Claims**

Multiplexed seismic data representing a plurality of seismic channels intensity modulates each sweep of the electron beam on a cathode-ray tube. Each successive sweep of the electron beam is photographically reproduced on a rotating drum plotter to provide a plurality of seismic traces. A multiposition selector switch is provided to select traces to be marked with a center line through the entire length of the trace as it is recorded on the drum plotter. A generator provides center-line pulses for the selected traces to intensity modulate the



electron beam of the cathode-ray tube in time coincidence with the intensity modulation of the electron beam by the multiplexed seismic data for the selected traces. A two-position switch is provided to permit the generator to reverse the order in which the traces are marked with a center line.

3,704,451

AUTOMATIC DATA RETRIEVAL AND DISPLAY SYSTEM

Samuel Reader Pearson, Farmers Branch, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 5, 1971, Ser. No. 104,038

Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **7 Claims**

An automatic data retrieval and display system is disclosed wherein solid state logic, motor drives and solenoid drives are utilized. Logic and drive circuitry control operation of a rotary file to rapidly select a desired data item from the file and accurately position it for display. Transistorized d.c. isolator circuit means isolate logic signals from a.c. drive power while servo positioning circuits effect positioning of the data item for display with maximum speed. A timing circuit provides a reset signal after a programmable delay.

3,704,452

SHIFT REGISTER STORAGE UNIT

William F. Beausoleil, Poughkeepsie; David T. Brown, Wappingers Falls, both of N.Y., and William A. Clark, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

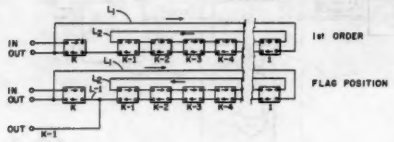
Filed Dec. 31, 1970, Ser. No. 103,201

Int. Cl. G06f *9/20;* **H03k** *5/00*

U.S. Cl. 340—172.5 **11 Claims**

A data storage unit is provided in which groups or "pages" of data including their addresses are stored in shift registers in successive positions, the registers being operable on a signal

requesting access to shift their contents repetitively to the next position in one or more loops which include a position wherein a page may be accessed and in one or more loops which excludes said access position. Controls are provided for varying the shifting in said loops such that the positions of



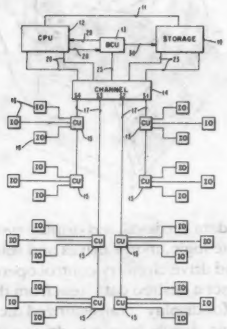
some or all of the pages of separately accessed classes are dynamically reordered so that they are presented to said access position on such signal in approximately or exactly the order in which they were last requested, thus reducing average access time in programs involving considerable repeated reference to a limited group of pages of the class.

3,704,453

CATENATED FILES

Wayne Waldo Blackwell, Rockville; John Goodell Earle; John Joseph O'Connell, both of Gaithersburg; Edwin Bruce Pierce, Damascus, and John Edward Shabe, Darnestown, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1971, Ser. No. 117,985
Int. Cl. G06f *7/06*
U.S. Cl. 340—172.5 **8 Claims**



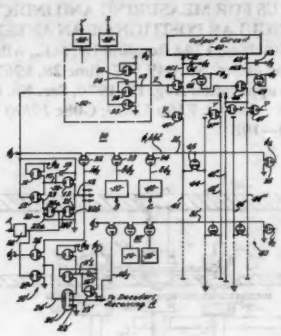
This invention concerns a peripheral control apparatus or channel which controls the transfer of data between input/output devices and a main memory of a data processing system. The channel performs input/output operations when instructed to do so by the data processing system by obtaining control words from a main storage. A plurality of subchannels share a common control section wherein means are provided to selectively combine a plurality of the input/output devices connected to the channel to appear as a single device to the user. This is accomplished by the generation of a plurality of control words from the single control word obtained from main memory and the distribution of logical records of a data set among the plurality of files.

3,704,454

ACCESSING SYSTEM FOR AND IN INTEGRATED CIRCUIT TYPE MEMORIES

Michael R. McCoy, San Jose, and Terry R. Walther, Sunnyvale, both of Calif., assignors to Electronic Arrays, Inc., Mountain View, Calif.

Filed May 18, 1970, Ser. No. 38,104
Int. Cl. G11c *11/34*
U.S. Cl. 340—173 SP **14 Claims**



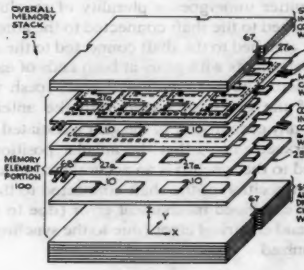
A read-only memory as MOS device is disclosed, operating with a two phase clock, decoder and decoder drivers using minimum size components. The memory cells are arranged on intersections of gate platings-conductive zone columns. The gate platings are driven by serial connected decoders during one phase, and discharged in the other phase during which column nodes are charged, selectively discharged during first phases in dependence upon further decoder circuitry.

3,704,455

3D-COAXIAL MEMORY CONSTRUCTION AND METHOD OF MAKING

Alfred D. Scarbrough, 9912 Tunney Avenue, Northridge, Calif.

Filed Feb. 1, 1971, Ser. No. 111,476
Int. Cl. G11c *17/00*
U.S. Cl. 340—173 SP **13 Claims**


OVERALL MEMORY STACK 52
STACK INTER-CONNECTION WAFERS 29
MEMORY CHIP WAFER 25
COMBINED INTER-CONNECTION & SPACER WAFER 27
MEMORY ELEMENT PORTION 100
SELECTION AND DRIVING CIRCUITRY WAFER 30

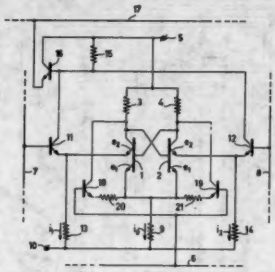
A semiconductor memory in which integrated circuit chips each containing semiconductor flip-flop memory elements are mounted to respective ones of a plurality of batch-fabricated, pressure-stacked electrically conductive wafers so as to form a compact, essentially all metal, three-dimensional memory structure. Coaxially-shielded X, Y and Z conductors are formed in the conductive wafers ny selective chemical etching for expeditiously providing the interconnections required for the integrated circuit chips in accordance with the desired memory organization.

3,704,456

ASSOCIATIVE STORAGE ELEMENT

John Barry Hughes, Brighton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 19, 1971, Ser. No. 190,556
Claims priority, application Netherlands, Oct. 22, 1970, 7015435
Int. Cl. G11c *15/00, 7/00, 11/40*
U.S. Cl. 340—173 AM 1 Claim



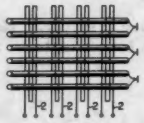
The invention provides an associative flip-flop storage element which does not go into stauration, thereby providing a fast switching rate with comparatively low voltage variations across the drive conductors for carrying out write and comparison processes.

3,704,457

DRIVING TECHNIQUE FOR THIN FILM MEMORY ELEMENTS

Hisao Maeda, deceased, late of Tokyo-to, Japan (by Hisaaki Maeda, heir); Takashi Sakuma, and Keisuke Kobayashi, both of Tokyo-to, Japan, assignors to Toko Kabushiki Kaisha, Tokyo-to, Japan

Continuation-in-part of Ser. No. 614,667, Feb. 8, 1967, abandoned. This application Jan. 19, 1970, Ser. No. 3,601
Claims priority, application Japan, Feb. 11, 1966, 41/8132
Int. Cl. G11c *11/04, 11/14*
U.S. Cl. 340—174 PW 12 Claims



A method of driving a memory device having a matrix memory consisting of information wires provided respectively with magnetic thin film and to be applied with information pulse currents and word conductor wires crossing perpendicularly with said information wires and to be applied with word pulse currents; in which both of writing-in of informations "1" and "0" are carried out, respectively, by first and second bipolar information pulse currents which are different in only their polarities.

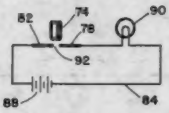
3,704,458

COMBINATION TRANSMISSION FLUID MONITOR AND FILTER

Wilbert Bernard Buchanan, Paulsboro, and Leon Haws, Wrightstown, both of N.J., assignors to Lorenzo Marini, Burlington, N.J., by said Buchanan and Haws

Filed Jan. 29, 1971, Ser. No. 110,994
Int. Cl. G08b *21/00*
U.S. Cl. 340—239 F 1 Claim

A combination transmission fluid monitor and filter installable on the transmission fluid cooler outlet line and including a replaceable filter contained within a body. A normally open, pressure responsive switch installs in a fitting communicating



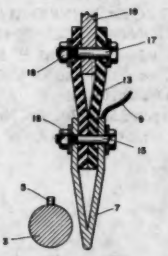
with the interior of the filter body and is provided with means to automatically close the switch upon sensing the presence of low transmission fluid pressure.

3,704,459

SEED PLANTER-FAILURE DETECTOR

Walter A. Young, Route 1, Pine Street, Creston, Ohio

Filed Oct. 4, 1971, Ser. No. 186,045
Int. Cl. G08b *21/00*
U.S. Cl. 340—271 4 Claims



A detector system for a seed planting machine of the type typically pulled behind a motorized tractor, and having a plurality of rotatable shafts connected by shear pins to a main drive shaft, is provided to detect when one or more of the rotatable shafts stops rotating during the machine's operation. An indicator panel is provided with light bulbs wired in parallel to one side of the tractors battery. Each of the bulbs is connected to a contact arm held in a position adjacent to a rotatable shaft. A pin is provided in each rotatable shaft to contact the contact arm intermittently upon rotation of the shaft. The rotatable shafts are grounded to the frame of the seed planting machine and to the frame of the tractor. The other side of the battery also is grounded to the frame of the tractor. Thus as each rotating shaft causes the pin therein to make contact with the contact arm an electrical circuit is completed and the indicator bulb wired to that contact arm lights up. Thus, when the seed planting machine is in operation, failure of an indicator light to intermittently blink "on" and "off" indicates that one of the rotating shafts has stopped rotating because of breakage of the shear pin connection.

3,704,460

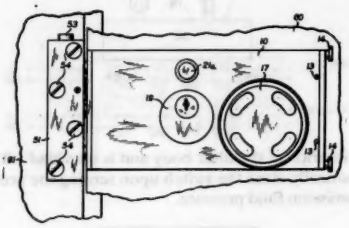
SELF-CONTAINED ALARM LOCK WITH TAMPER-PROOF INTERLOCKED CASING FORMED FROM EXTRUSION

Stanley William Frank, 24 Clinton Street, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 676,804, Oct. 20, 1967, abandoned. This application Aug. 18, 1970, Ser. No. 64,715
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 7 Claims

An integral self-contained, key-operated alarm lock, the major portion of the casing for which can be made from two

longitudinally slidably tongued-groove interlocking channel extrusions, has an electronic alarm circuit composed of a



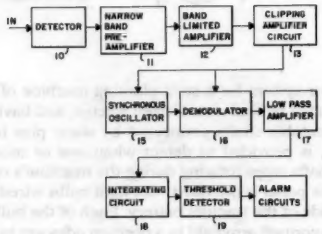
finger on-off switch, a striker proximity switch, a bolt position switch and a latching switch which holds the alarm on when it has been activated, until properly shut off.

3,704,461

INTRUSION DETECTION SYSTEM RESPONSIVE TO INTERRUPTION OF A TRANSMITTED BEAM

Edward A. Rose, San Jose; Richard H. Krohn, Fremont, and Donald E. Slater, San Jose, all of Calif., assignors to Optronix, Inc., Santa Clara, Calif.

Filed March 25, 1970, Ser. No. 22,183
Int. Cl. G08b *13/18*
U.S. Cl. 340—258 B **8 Claims**



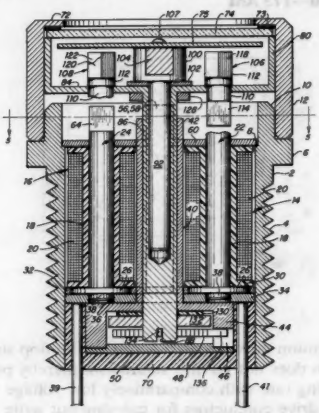
An infrared intruder detection system operable under severe weather conditions including fog, rain and snow over great distances exceeding 500 feet in the severest weather comprises a pulsed infrared transmitter and a self-contained spaced apart self-synchronized infrared receiver. Upon interruption of the transmitted beam for a predetermined period, the receiver generates an alarm in response to the remaining ever present signals due to ambient light and thermal instrument noise. When the beam is not interrupted, a local synchronous oscillator will track the incoming signal pulses. In the presence of an intruder, the pulsed beam is no longer received and the oscillator is unable to track the resulting amplified noise signal which arises from ambient light and thermal instrument noise. This results in the generation of an error signal at the output of the demodulator to which the oscillator is coupled. By the inclusion of appropriate bandpass amplifiers, filters and integrating circuits set to respond to predetermined thresholds coupled to the output of the demodulator, the receiver is able to discriminate between an intruder and such momentary interrupts as are caused by birds, falling leaves and blowing bits of paper which otherwise might cause false alarms.

3,704,462

MANUALLY RESETTABLE ELECTROMAGNETIC INDICATORS

George E. Pihl, Abington, Mass., assignor to Miniature Electronic Components Corp., Holbrook, Mass.

Filed Sept. 21, 1970, Ser. No. 73,715
Int. Cl. G08b *5/22*
U.S. Cl. 340—373 **24 Claims**



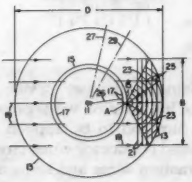
A manually resettable electromagnetic flag indicator capable of binary indication comprising a sealed electromagnet sub-assembly and a display sub-assembly coupled together so that a pulse input to the electromagnet sub-assembly will cause the display sub-assembly to be operated to provide a first predetermined indication. The two sub-assemblies are coupled so that manual rotation of a portion of the display sub-assembly relative to the electromagnet sub-assembly will cause a second predetermined indication to be displayed.

3,704,463

DIRECTION FINDING ANTENNA SYSTEM

George H. Barry, Saratoga, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 2, 1970, Ser. No. 42,640
Int. Cl. G01s *3/74*
U.S. Cl. 343—100 R **7 Claims**



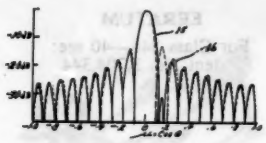
A direction finding antenna system having a large circle of active reflector antenna elements and a smaller concentric circle of focal point active antenna elements. The outer circle consists of several hundred antenna elements where each element comprises a horizontal one-half wave length horizontal dipole and a one-fourth wave length vertical dipole. The horizontal dipole receives the incoming signal the output of which is amplified and applied to the input of the vertical dipole which then retransmits the signal. A group of reflector antenna elements forming a segment of the outer circle receive and retransmit the incoming signal to a focal point where the signal is received by a focal point antenna on the inner circle. The signal from the focal point antenna receiving the retransmitted signal thus represents the output of a directional antenna. A display of signal arrival direction is obtained from the output of the focal point antennas.

3,704,464

METHOD OF SUPPRESSING SELECTED ANTENNA RADIATION PATTERN SIDE LOBES WHILE RETAINING MAXIMUM DIRECTIVE GAIN

Charles J. Drane, Jr., Cambridge; John F. McIlvenna, Jr., Lynn, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 10, 1970, Ser. No. 88,355
Int. Cl. H01 *3/26*; H01q *3/26*
U.S. Cl. 343—100 LE 1 Claim



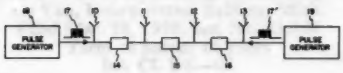
A method for maximizing aerial directive gain while simultaneously placing nulls (suppressing side lobes) in the far-field radiation pattern of the array. The expressions of the standard antenna gain equation that define the side lobes to be eliminated are equated to zero and solved for current phase and amplitude values. A new set of current values for the standard directive gain equation are derived through a transform operator that includes the derived phase and amplitude values. Techniques substantially identical are used to maximize a standard gain equation utilizing the new set of current values. The current phase and amplitude values derived from the maximization step are used to feed the antenna.

3,704,465

ANGULAR POSITION DETERMINING SYSTEM COMPENSATED FOR DOPPLER

Raymond J. Masak, and Herbert F. Baurle, both of East Northport, N.Y., assignors to Hazeltine Corporation

Filed Aug. 28, 1970, Ser. No. 67,820
Int. Cl. G01s *1/02*
U.S. Cl. 343—102 14 Claims



Disclosed are systems for determining the true angular position of a target with respect to a reference location. One such system employs a novel array of antenna units at the reference location. The units are uniquely excited by a pulse type signal in two opposite predetermined sequences to produce a pair of radiated pulse trains. A target located in the field of this array is illuminated by these radiated pulse trains each of which has a phase distribution proportional to the angular position of the target with respect to the array and opposite in sense to that of the other. Furthermore, the frequency of each pulse train undergoes a doppler shift due to the radial velocity, if any, of the target with respect to the array and therefore the ambiguity due to such shifts can be compensated for by detecting the phase distribution of each pulse train and processing the information obtained. In this manner an indication of the target's true angular position, free from doppler ambiguities, can be provided either at the reference location alone, the target alone, or at both the reference location and the target.

3,704,466

SURVIVABLE TELESCOPING ANTENNA

Robert D. Coyer, Renton, Wash., and Robert M. Weigel, deceased, late of Seattle, Wash. (by Virginia Weigel, heiress), assignors to The United States of America as represented by the Secretary of the Air Force

Filed April 22, 1971, Ser. No. 136,461
Int. Cl. H01q *1/04*
U.S. Cl. 343—719 7 Claims

A survivable telescoping antenna having an outer housing and a plurality of elements nested therein. A radiator is mounted on the innermost element. When the elements are in a retracted position within the outer casing, the radiator is protected from severe environmental conditions by a closure element. Upon activation of a power source, the elements are erected from the outer casing causing ejection of the closure element and exposing the radiator for operation thereof. This antenna is thereby capable of surviving extreme environmental conditions and yet providing a reliable operation when in use.

3,704,467

REVERSIBLE RECORD AND STORAGE MEDIUM

Brian G. Frock, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Sept. 14, 1970, Ser. No. 72,234
Int. Cl. G01d *15/34*
U.S. Cl. 346—1 10 Claims

This disclosure is directed to a reversible, yet optionally permanent dual electro-optical record and storage medium, bistable in both the optical and electrical modes and non-volatile in the electrical mode having high resistivity contrast in the electrical mode between the write and erase states, high resolution and contrast in the optical mode between the write and erase states. The record medium can be used for display purposes and is capable of high bitpacking density and thermal microrecording and erasure and comprises a baked oxide solid film material containing lead oxide, boron oxide, copper oxide and silicon dioxide (silica) as major components and optionally minor concentrations of other oxides (depending on the glass substrate upon which the record medium is formed).

3,704,468

ELECTRONIC GRAPHIC RECORDING SYSTEM

Wasaburo Ohta, Yokohama, and Noboru Murayama, Sagamihara, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

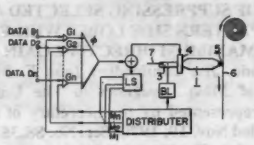
Filed April 24, 1970, Ser. No. 31,598

Claims priority, application Japan, April 25, 1969, 44/32096

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 CR **6 Claims**

An electronic graphic recording system is provided in which the electron beam deflection in marking means as cathode-ray tube or the like is controlled in response to a signal representative of a variable or data and a signal representative of the electron beam deflection is recorded upon moving exhibiting means, thereby providing a record of the variable or data as a function of time. A circuit for shifting the level of the variable or data signal by a predetermined level and a blanking circuit



are further added so that a plurality of variables or data may be recorded upon a single exhibiting means.

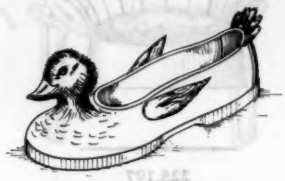
ERRATUM

For Class 346—40 see:
Patent No. 3,704,344

DESIGNS

NOVEMBER 28, 1972

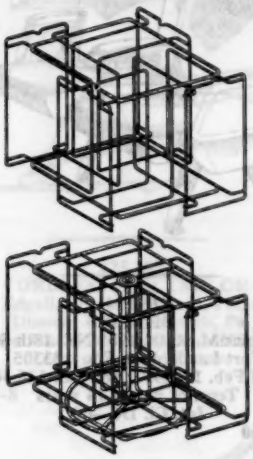
225,188
OVERSHOE
Mary Keeney Iskyan, 34—15 74th St., Jackson Heights, N.Y. 11372
Filed Sept. 4, 1970, Ser. No. 24,834
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279



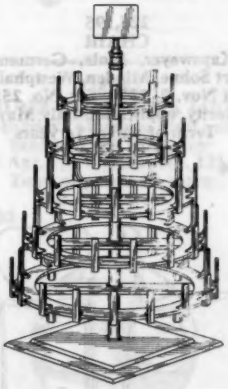
225,189
SHOE SOLE
Otho Davis, Durham, N.C., assignor to Cameron Athletic Corporation, Houston, Tex.
Original design application Apr. 21, 1971, Ser. No. 22,548, now Patent No. 221,122, dated July 13, 1971. Divided and this application Sept. 28, 1970, Ser. No. 25,225
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

225,190
CONVERTIBLE TABLE
Auburn G. Van Syoc, Belding, Mich., assignor to Lu Van, Incorporated, Belding, Mich.
Filed Mar. 10, 1970, Ser. No. 21,840
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—3

225,191
DISPLAY STAND
Andelfo J. Russo, Blauvelt, N.Y., assignor to Cadillac Wire Corp., Elmsford, N.Y.
Filed Mar. 19, 1971, Ser. No. 126,392
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—28

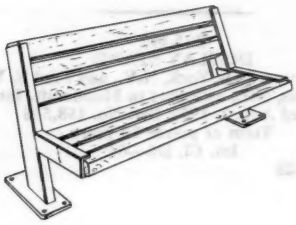


225,192
DISPLAY STAND
Michael Chernow, New York, N.Y., and Fred E. Yarkoni, Paramus, N.J., assignors to Monocraft, Inc.
Filed Aug. 2, 1971, Ser. No. 168,518
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—28

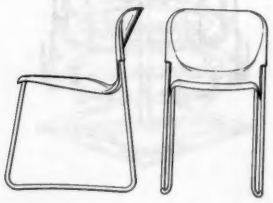


225,193
AIRPLANE SEAT
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Feb. 22, 1971, Ser. No. 117,853
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—48

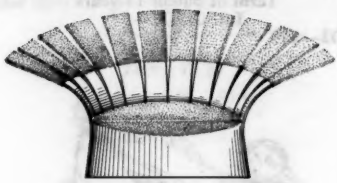
225,194
BENCH
Douglas M. Ruth, 1901 NE. 18th St., Fort Lauderdale, Fla. 33305
Filed Feb. 17, 1971, Ser. No. 116,303
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—60



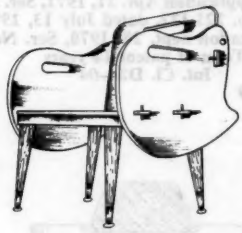
225,195
CHAIR
Gerd Lange, Kapsweyer, Pfalz, Germany, assignor to Firma Drabert Sohne, Minden, Westphalia, Germany
Filed Nov. 9, 1970, Ser. No. 25,888
Claims priority, application Italy May 18, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—66



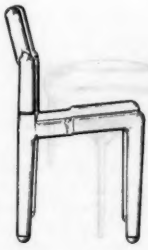
225,196
CHAIR OR SIMILAR ARTICLE
Leandre A. Poisson, 25 Newell St., Manchester, N.H. 03101
Filed July 15, 1970, Ser. No. 23,967
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69



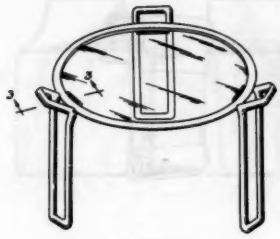
225,197
CHAIR
Earl E. Lockwood, 35 Crosby St., East Hartford, Conn. 06118
Filed Jan. 15, 1971, Ser. No. 106,942
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—71



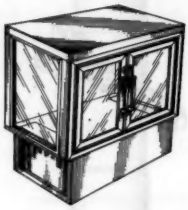
225,198
CHAIR
Tom Erik Torbjorn Ahlstrom and Hans Otto Georg Ehrich, both of 13 Brannkyrkagatan, Stockholm, Sweden
Filed Feb. 16, 1971, Ser. No. 115,937
Term of patent 7 years
Int. Cl. D6—*02*
U.S. Cl. D6—78



225,199
TABLE
Jonathan Ginat, % A.C.I. Trading Co., Ltd., 134 5th Ave., New York, N.Y. 10011
Filed Dec. 29, 1970, Ser. No. 26,692
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

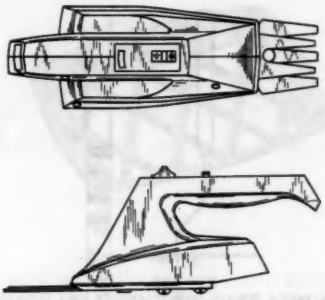


225,200
REFRIGERATED SHOW CASE
Tony J. Bressickello, 13015 S. Normandie Blvd., Gardena, Calif. 90249
Filed Oct. 8, 1970, Ser. No. 25,392
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—172



225,201
BOOKCASE
Henry S. Akola, Glendale, Calif. (% John E. Wagner, 1041 E. Green St., Suite 202, Pasadena, Calif. 91101)
Filed Aug. 13, 1970, Ser. No. 24,482
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

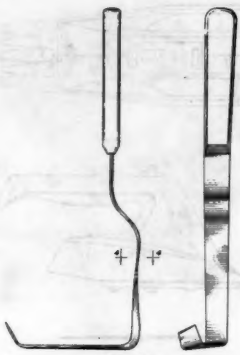
225,202
CORDLESS SHEAR
William E. Bartasevich, Jr., Glenshaw, Pa., assignor to Disston, Inc., Pittsburgh, Pa.
Filed Mar. 1, 1971, Ser. No. 119,982
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8



225,203
UPRIGHT CORDLESS ELECTRIC GRASS SHEAR
James E. Edgell, Bradford Woods, Pa., assignor to Disston, Inc., Pittsburgh, Pa.
Filed Mar. 1, 1971, Ser. No. 119,983
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

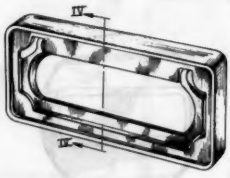
225,204
THUMB TURN FOR A LOCK
Marron Kendrick, Atherton, Calif., assignor to Schlage Lock Company
Filed Apr. 7, 1971, Ser. No. 132,268
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—108

225,205
HAND-HELD GARDEN HOE OR SIMILAR ARTICLE
Eugene B. Miller, 14515 Michigan Ave., Riverdale, Ill. 60627
Filed Mar. 17, 1971, Ser. No. 125,453
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—12



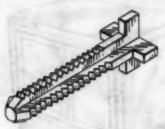
225,206
VEHICLE DOOR HANDLE SHIELD
Larry D. Heggen, 530 N. 4th, Carlisle, Iowa 50047
Filed Aug. 18, 1969, Ser. No. 18,741
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—137

225,207
SIMULATED FLUSH PULL
William Doyle Watt, Jr., Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.
Filed Mar. 15, 1971, Ser. No. 124,612
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—158



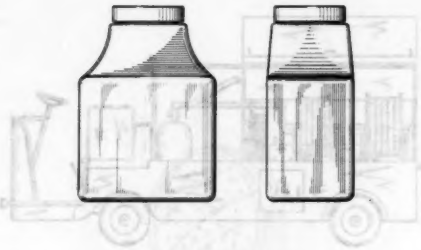
225,208
PRICE TAG HOLDER
Terry G. Miller, 1469 Campbell, Apt. 40, Houston, Tex. 72055
Filed Mar. 8, 1971, Ser. No. 122,282
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—244

225,209
SCREW
Terence Robert Raynor, London, and Philip Sydney Smith, Bideford, England, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 21, 1971, Ser. No. 108,684
Claims priority, application Great Britain Aug. 8, 1970
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—267



225,210
BOTTLE
Kurt Becker, Obernkirchen, Germany, assignor to Hermann Heye, Allee, Germany
Filed Aug. 25, 1970, Ser. No. 24,682
Claims priority, application Germany Mar. 6, 1970
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—99

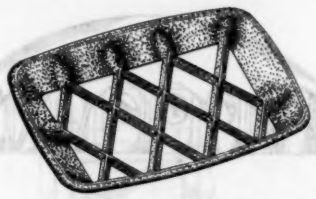
225,211
PACKAGING CONTAINER OR SIMILAR ARTICLE
Mortimer D. Sackler, New York, N.Y., and Mordecai R. Craig, Demarest, N.J., assignors to Synergistics
Filed June 28, 1971, Ser. No. 157,807
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—163



225,212
BOTTLE
Alain Pieyre de Mandiargues, Paris, France, assignor to Parfums Guy Laroche, Paris, France
Filed Nov. 13, 1970, Ser. No. 25,965
Claims priority, application France May 13, 1970
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169

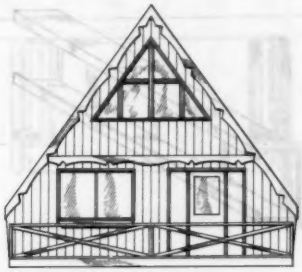
225,213
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,352
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

225,214
MOLDED PACKAGING TRAY FOR MEAT OR THE LIKE
Richard F. Reifers, New Canaan, Conn., and Kenneth D. Bixler, Huntington, N.Y., assignors to Diamond International Corporation, New York, N.Y.
Filed Jan. 27, 1971, Ser. No. 110,365
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219



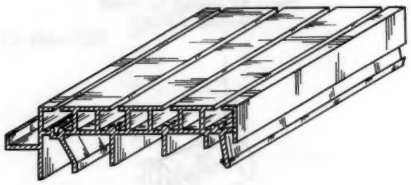
225,215
REMOVABLE WINDOW CASE STRUCTURE
John P. Francis, 20 Boston St., Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 19,899, Nov. 3, 1969. This application Oct. 2, 1970, Ser. No. 25,311
Term of patent 14 years
The portion of the term of the patent subsequent to Mar. 9, 1985, has been disclaimed
Int. Cl. D25—*02*
U.S. Cl. D13—1

225,216
MODULAR HOME
Roger A. King and Keith O. Burton, Elkhart, Ind., assignors to Bur Kin Homes Corporation, White Pigeon, Mich.
Filed Jan. 11, 1971, Ser. No. 105,761
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

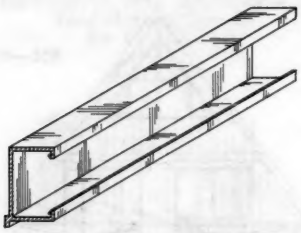


225,217
HOUSE
Joseph D. Yacoboni, 740 Olivant Place, Pittsburgh, Pa. 15206
Filed Nov. 1, 1971, Ser. No. 194,806
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

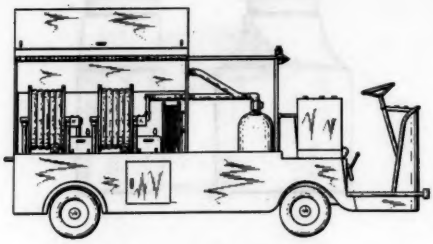
225,218
EXTRUDED PLASTIC SILL TRACK FOR A WINDOW UNIT
Dominique Dallaire and Raymond M. Dallaire, St. David, Quebec, Canada, assignors to P.H. Plastics Inc., Lauzon, Quebec, Canada
Filed Jan. 13, 1971, Ser. No. 106,297
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



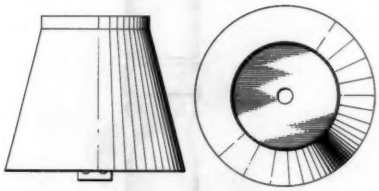
225,219
EXTRUDED PLASTIC FRAME COVERING FOR A WINDOW UNIT
Dominique Dallaire and Raymond M. Dallaire, St. David, Quebec, Canada, assignors to P.H. Plastics Inc., Lauzon, Quebec, Canada
Filed Jan. 13, 1971, Ser. No. 106,300
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



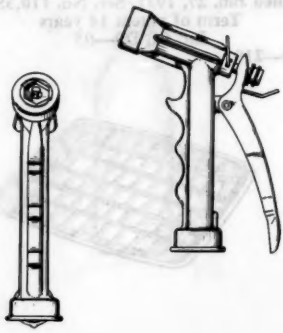
225,220
MOBILE FIRE DETECTION AND SUPPRESSION UNIT
Robert E. Benshoof, Covina, Calif., assignor to CBF Systems, Inc., Covina, Calif.
Filed Jan. 11, 1971, Ser. No. 105,756
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



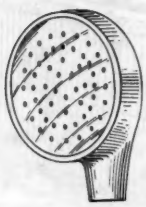
225,221
AUTOMOBILE ANTENNA IDENTIFICATION DEVICE
Thaddeus A. Sikorski and Helen K. Sikorski, both of 208 Haddon Ave., Collingswood, N.J. 08108
Filed May 28, 1971, Ser. No. 148,295
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



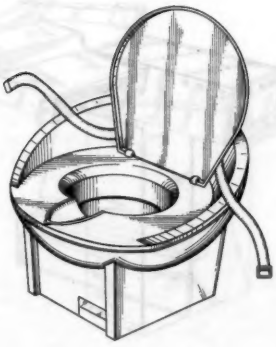
225,222
HOSE NOZZLE
Robert A. Gilmour, Somerset, Pa., assignor to Gilmour Manufacturing Company, a division of R. M. Smith, Inc., Somerset, Pa.
Filed Dec. 21, 1970, Ser. No. 26,599
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



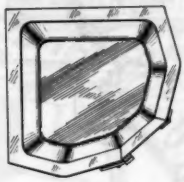
225,223
SPRAY HEAD
Jordan I. Rotheiser, Highland Park, Ill., assignor to Selfix, Inc.
Filed Dec. 21, 1970, Ser. No. 26,575
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

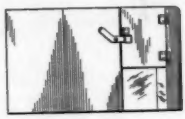


225,224
INFANT'S TRAINING CHAIR
E. Burton Benjamin, Highland Park, Ill., assignor to Welsh-Co., St. Louis, Mo.
Filed Oct. 9, 1970, Ser. No. 25,404
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—53



225,225
BATHTUB
Lionel E. Russell, Rte. 1, Oologah, Okla. 74053
Filed Nov. 13, 1970, Ser. No. 25,972
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

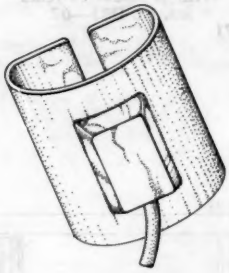




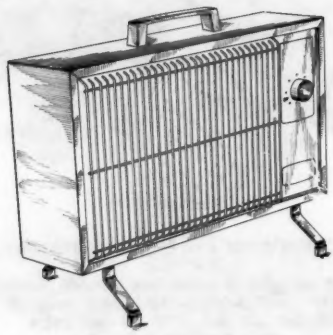
225,226
SUPPORT LEG FOR ELEVATED TOILET SEAT
William R. Brewer, Arleta, Calif., assignor to Hamilton C. de Jong (doing business as Safety Brothers), Pasadena, Calif.
Original design application Apr. 22, 1970, Ser. No. 22,557. Divided and this application Oct. 13, 1971, Ser. No. 189,076
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

225,227
PORTABLE COMBINED HEATER AND LAMP
Jules A. Court, Palo Alto, Calif., assignor to TC Products, Palo Alto, Calif.
Filed Dec. 9, 1969, Ser. No. 20,424
Term of patent 14 years
Int. Cl. D23—*03*; D26—*02*
U.S. Cl. D23—77

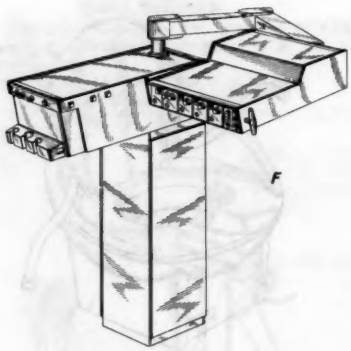
225,228
ELECTRIC RESISTANCE HEATER
Edwin D. Hoyt, Hemet, Calif., assignor to Rama Industrial Heater Co., San Jacinto, Calif.
Filed Apr. 26, 1971, Ser. No. 137,739
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77



225,229
PORTABLE ELECTRIC HEATER
William J. Cook, Trumbull, Conn., assignor to General Electric Company
Filed Mar. 15, 1971, Ser. No. 124,631
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123

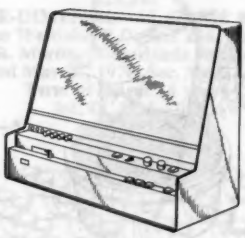


225,230
DENTAL OPERATORY UNIT
H. John Kretschmer, New York, N.Y., assignor to Modumatic Industries, Inc.
Filed Sept. 23, 1971, Ser. No. 183,295
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1

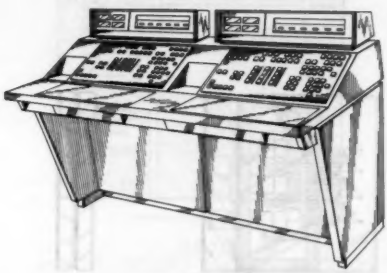


225,231
AUDIBLE TRAINING DEVICE OR THE LIKE
Gerard J. O Brien, 33 Pamrapo Ave., Jersey City, N.J. 07307
Filed Dec. 2, 1970, Ser. No. 26,249
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

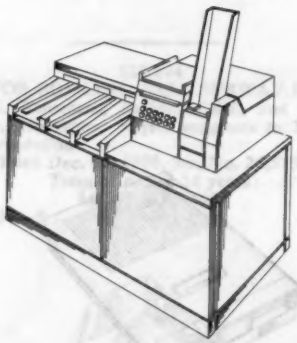
225,232
TEACHING MACHINE
Floyd L. Arnold, Marlboro, N.J., John Bruce, Wilton, Conn., and Philip A. Celli, Lincroft, and James R. Patmore, Neptune, N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.
Filed Dec. 7, 1970, Ser. No. 26,343
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1



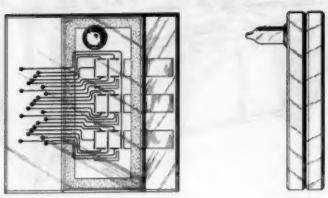
225,233
TELEPHONE OPERATOR'S SERVICE CONSOLE
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Jan. 11, 1971, Ser. No. 105,770
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



225,234
DOCUMENT READER
Wayne L. Aderman, Zumbro Falls, and Collan B. Kneale, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 2, 1971, Ser. No. 112,093
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



225,235
SEGMENTED NUMERIC DISPLAY PANEL
Richard A. Martel, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Dec. 28, 1970, Ser. No. 26,649
Term of patent 14 years
Int. Cl. D14—*02;* D20—*03*
U.S. Cl. D26—5

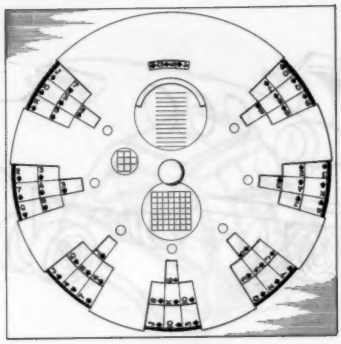


225,236
CASSETTE TAPE RECORDER
Georg Friedrich Papst, Karl-Maier Strasse 1, St. Georgen, Germany
Filed Mar. 25, 1971, Ser. No. 128,205
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

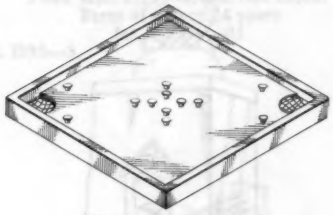
225,237
INTERCOMMUNICATIONS SET
Louis Lucien Lepoix, Baden-Baden, Germany, assignor to La Telephonie Industrielle et Commerciale "Telic"
Filed Apr. 5, 1971, Ser. No. 131,146
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

225,238
TABLE ORNAMENT
Chosuke Miyahira, 373 Park Ave. S., New York, N.Y. 10016
Filed Mar. 11, 1971, Ser. No. 123,493
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

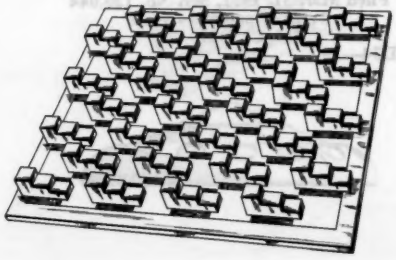
225,239
GAME DEVICE
Elaine G. Vigan, 1932 Weepah Way, Hollywood, Calif. 90046
Filed June 10, 1969, Ser. No. 17,622
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



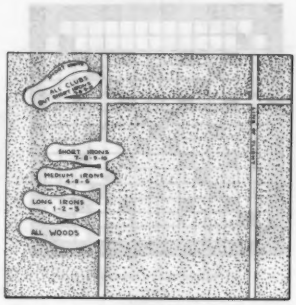
225,240
POOL GAME BOARD
Alfred C. Einstein and Norman C. Wolff, Jr., Clayton, Mo., and Helmar David Moran, York, Pa., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.
Filed Feb. 20, 1970, Ser. No. 21,554
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



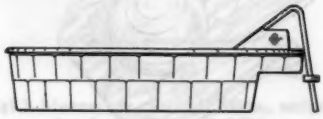
225,241
THREE-DIMENSIONAL GAME BOARD
T. Walton Westlake, P.O. Box 256, Philipsburg, St. Martin, Netherlands Antilles
Filed May 27, 1970, Ser. No. 23,168
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



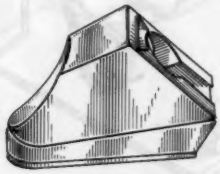
225,242
GOLF PRACTICE MAT
Forrest W. Pruitt, 1405 Gayla Drive, Quincy, Ill. 62301
Filed July 21, 1970, Ser. No. 24,044
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



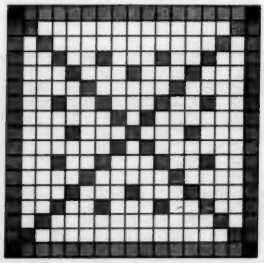
225,243
SWIMMING POOL
Ascher Chase, Norfolk, Va., assignor to General Foam Plastics Corp., Norfolk, Va.
Filed Sept. 22, 1970, Ser. No. 25,145
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



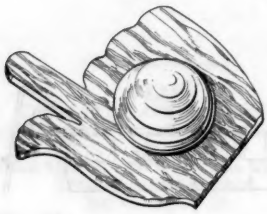
225,244
HOOD FOR BOWLING BALL SUBWAY RETURN
Richard G. Reineman, Balboa, Calif., and George E. Schaefer, Muskegon, Mich., assignors to The Brunswick Corporation
Filed Dec. 15, 1970, Ser. No. 26,515
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



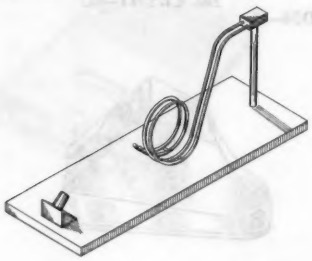
225,245
GAME BOARD
Joachim Berger, 20 Bahnhofstr., 52 Siegburg, Germany
Filed Jan. 13, 1971, Ser. No. 106,315
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



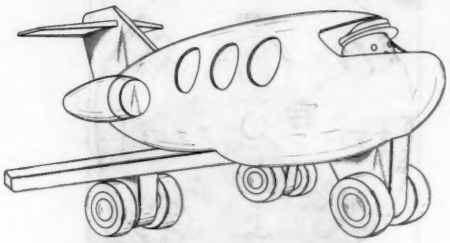
225,246
POINTER FOR A GAME BOARD OR SIMILAR ARTICLE
Jacob B. Burke, 6771 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Feb. 19, 1971, Ser. No. 117,224
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



225,247
MARBLE RUNWAY NOVELTY DEVICE
James D. Hughes, 4714 Spellman, Houston, Tex. 77035
Filed Nov. 23, 1970, Ser. No. 26,122
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



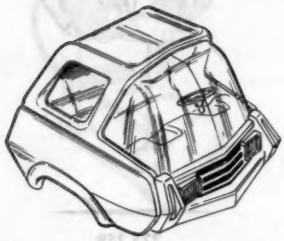
225,248
TOY AIRPLANE
Robert K. Ostrander, Rolling Meadows, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 3, 1971, Ser. No. 120,791
Term of patent 14 years
Int. Cl. D12—*01*
U.S. Cl. D34—15



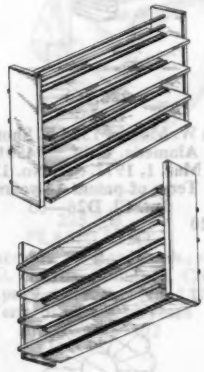
225,249
JACK-IN-THE-BOX TOY
Robert K. Ostrander, Rolling Meadows, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Mar. 3, 1971, Ser. No. 120,792
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

225,250
AERIAL TOY
George C. Sun, 801 Cooper Landing Road, Cherry Hill, N.J. 08034
Filed Mar. 31, 1971, Ser. No. 130,044
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

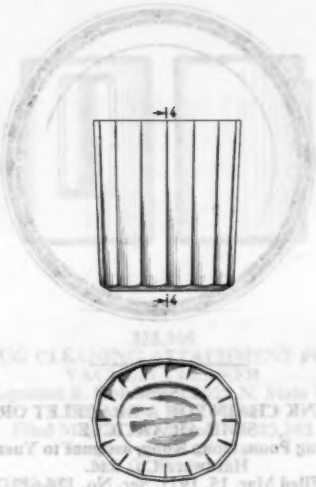
225,251
TOY VEHICLE CAB
Vernon A. Peterson, Minneapolis, Minn., assignor to Tonka Corporation, Mound, Minn.
Filed May 24, 1971, Ser. No. 146,583
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



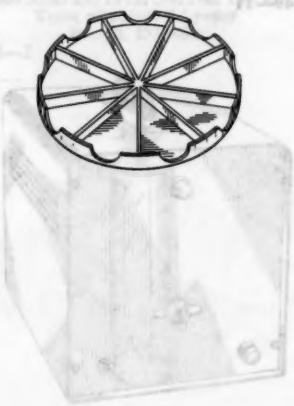
225,252
PLANT GROWTH APPARATUS
R. Louis Ware, 2108 Middle Fork Road, Northfield, Ill. 60093
Filed Sept. 21, 1970, Ser. No. 25,087
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D35—3



225,253
DRINKING GLASS OR THE LIKE
Jens H. Quistgaard, Copenhagen, Denmark, assignor to Dansk Designs Ltd., Mount Kisco, N.Y.
Filed Oct. 30, 1970, Ser. No. 25,730
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8

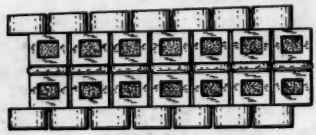


225,254
PIZZA TRAY
Daniel J. Meaney, Jr., Duluth, Minn., assignor to Jeno's, Inc., Duluth, Minn.
Filed Jan. 21, 1971, Ser. No. 108,696
Term of patent 3½ years
Int. Cl. D7—*02*
U.S. Cl. D44—1

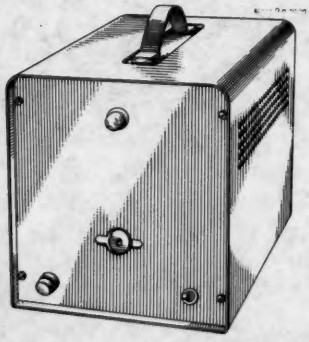


225,255
DINNER PLATE OR SIMILAR ARTICLE
Rebecca M. McMahon, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 22, 1971, Ser. No. 136,645
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

225,256
LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Yuen Sang Poon, Hong Kong, assignor to Yuen Sang Hardware Co., Ltd.
Filed Mar. 15, 1971, Ser. No. 124,622
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4



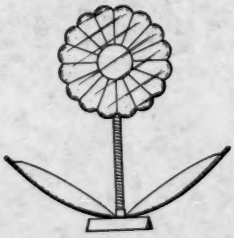
225,257
DUAL PLUG CLEANER
Wilbert E. Thrasher, 14421 SW. 288th St., Leisure City, Fla. 33030
Filed Feb. 24, 1970, Ser. No. 20,926
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D49—11



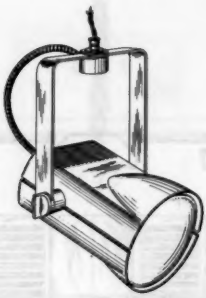
225,258
ILLUMINABLE NOVELTY PIN
Perry Feuer, Roslyn, N.Y., assignor to Creative Creations, Inc., New York, N.Y.
Filed Feb. 25, 1971, Ser. No. 119,077
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19

225,259
BRACKET LAMP OR SIMILAR ARTICLE
Frank Skupien, 5443 S. Wolcott, Chicago, Ill. 60609
Filed May 20, 1971, Ser. No. 145,598
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4

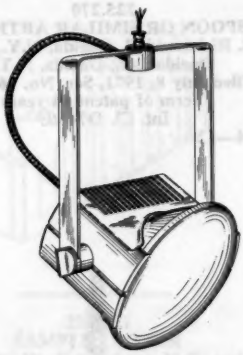
225,260
LAMP
Stephen W. Morris, 1324 E. Shore Drive, Alameda, Calif. 94501
Filed Mar. 1, 1971, Ser. No. 120,003
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20



225,261
FLOODLIGHT
Herve Houplain, Demeurant 41, Lamotte-Beuvron, France
Filed Dec. 15, 1971, Ser. No. 208,517
Claims priority, application France July 22, 1971
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20

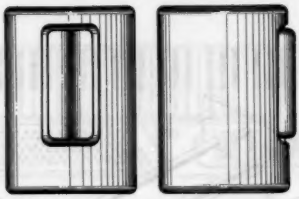


225,262
FLOODLIGHT
Herve Houplain, Demeurant 41, Lamotte-Beuvron, France
Filed Dec. 15, 1971, Ser. No. 208,518
Claims priority, application France July 22, 1971
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20

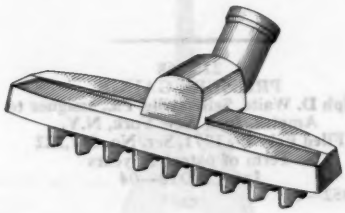


225,263
FLASHLIGHT
Joseph G. Bacevius, Shelton, Conn., assignor to Paul G. Garrity, Stamford, Conn.
Filed Apr. 9, 1971, Ser. No. 132,931
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24

225,264
TABLE LIGHTER
Dieter Rams, Konigstein, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Mar. 25, 1970, Ser. No. 21,942
Claims priority, application Germany Oct. 13, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

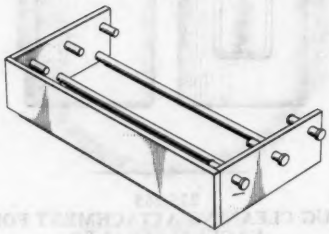


225,265
RUG CLEANING ATTACHMENT FOR VACUUM CLEANER
Siegmund B. Holubinka, 1022 N. Main St., Naperville, Ill. 60540
Filed May 28, 1970, Ser. No. 23,203
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—18

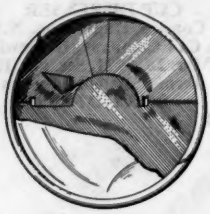


225,266
CUP DISPENSER
Michael Alan Cousins, Huntington, N.Y., assignor to American Can Company, Greenwich, Conn.
Filed Mar. 25, 1971, Ser. No. 128,218
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D52—2

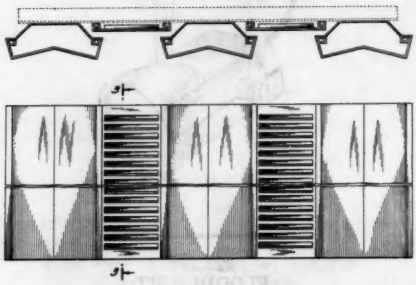
225,267
WRAP DISPENSER
Harper Roisman, 225 N. Bundy Drive, Los Angeles, Calif. 90049
Filed June 4, 1971, Ser. No. 150,257
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D52—2



225,268
PRESSURE GAUGE
Ralph D. Waite, Sellersville, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed Feb. 19, 1971, Ser. No. 117,222
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6



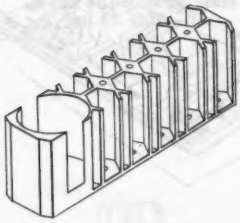
225,269
GRILLE
Patrick Zampetti and Robert Deuchler, Cranford, N.J., assignors to Construction Specialties Inc., Cranford, N.J.
Filed Mar. 5, 1970, Ser. No. 21,752
Term of patent 14 years
Int. Cl. D25—*02*; D23—*03*
U.S. Cl. D54—2



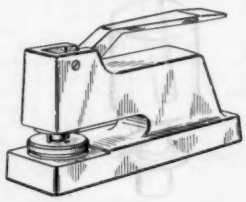
225,270
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed July 8, 1971, Ser. No. 160,983
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

225,271
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 15, 1971, Ser. No. 208,510
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

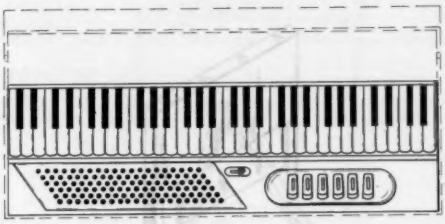
225,272
TOOL HOLDER
Roger W. Wheeler, Reading, Mich., assignor to Vaco Products Company
Filed Sept. 21, 1970, Ser. No. 25,112
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1



225,273
SAMPLE CUTTER
James A. King, Sr., Greensboro, N.C., assignor to J. A. King & Company, Greensboro, N.C.
Filed May 21, 1971, Ser. No. 145,987
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D55—1



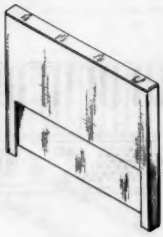
225,274
KEYBOARD FOR AN ELECTRIC ORGAN OR SIMILAR ARTICLE
Anthony J. Shabbarrasi, 1068 Dewey Ave., Rochester, N.Y. 14613
Filed Oct. 9, 1970, Ser. No. 25,409
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—1



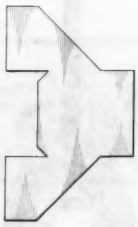
225,275
GUITAR OR SIMILAR ARTICLE
Buck Owens, Bakersfield, Calif., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.
Filed Feb. 11, 1971, Ser. No. 114,749
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

225,276
MUSICAL INSTRUMENT
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Feb. 25, 1971, Ser. No. 119,069
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2

225,277
COVER FOR A BED HEADBOARD OR SIMILAR ARTICLE
Eloise Maxwell Leigh, 409 Mead St. SE., Atlanta, Ga. 30315
Filed Dec. 14, 1970, Ser. No. 26,487
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—198

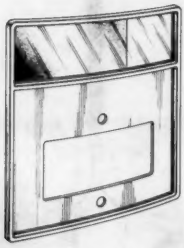


225,278
ADHESIVE TAB FOR ROLLS OF SHEET MATERIAL
Noel John Baker, London, England, assignor to Witton-James Limited, Wembley, Middlesex, England
Filed Nov. 12, 1970, Ser. No. 25,940
Claims priority, application Great Britain May 11, 1970
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D59—2

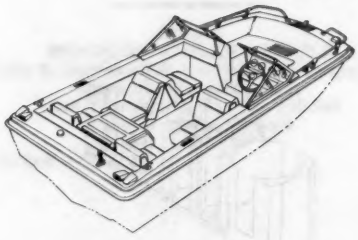


225,279
ELECTROSTATIC COPYING MACHINE
Paul Matwey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.
Filed Oct. 27, 1970, Ser. No. 25,681
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

225,280
FRONT PANEL FOR CAMERA OR SIMILAR ARTICLE
James M. Conner, Westchester, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.
Filed June 17, 1971, Ser. No. 154,256
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1



225,281
BOAT UPPER SHELL
Edward W. Peterson, Bannockburn, Ill., assignor to Silverline, Inc., Moorhead, Minn.
Filed Sept. 17, 1970, Ser. No. 25,035
Term of patent 7 years
Int. Cl. D12—*06*
U.S. Cl. D71—1

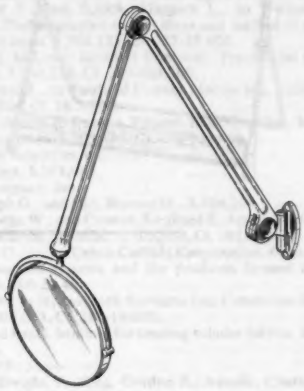


225,282
FLUID DISPENSING UNIT FOR PRIMING ENGINES OR THE LIKE
Gilbert R. Grigsby, Los Angeles, Calif., assignor to Lubrastart International, Pacoima, Calif.
Filed Nov. 27, 1970, Ser. No. 26,197
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1

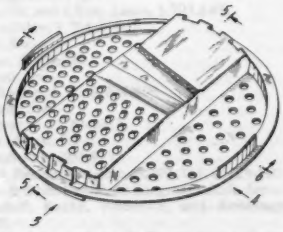
225,283
CLOTHES DISPLAY RACK
Barry Axelrod, Los Angeles, Calif., assignor to Laurel Line Products, Los Angeles, Calif.
Filed Feb. 18, 1971, Ser. No. 116,742
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—8

225,284
HANDLE FOR A STYLING COMB
Leandro P. Rizzuto and Milton Schrager, Brooklyn, N.Y., assignors to Continental Hair Products, Inc.
Filed Dec. 16, 1971, Ser. No. 209,005
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

225,285
MIRROR
Michael V. Heckathorn, Northridge, Calif., assignor to Foresight Products, Inc., Chatsworth, Calif.
Filed July 8, 1970, Ser. No. 23,859
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D86—10

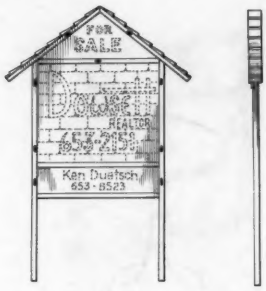


225,286
GRATER
Harold P. Ashton, Providence, and James B. Swett, Barrington, R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 30, 1970, Ser. No. 26,705
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1



225,287
WEAVING FRAME
Eva Tandberg, Aslokkveien 26, Slependen, Norway
Filed Aug. 23, 1971, Ser. No. 174,305
Claims priority, application Norway Mar. 18, 1971
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D92—15

225,288
SIGN
James D. Dowsett, 403 Plymouth Drive, Davison, Mich. 48423
Filed Nov. 27, 1970, Ser. No. 26,200
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF NOVEMBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abcor, Inc.: *See—*
Nuwayser, Elie S., 3,703,896.

Actron Industries, Inc.: *See—*
Forys, Edward Louis; Lofftus, Leroy A.; Malueg, Richard Milton; and Montalbano, Albert F., 3,703,999.

Adams, James E.: *See—*
Wysocki, Joseph J.; Adams, James E.; and Madrid, Robert W., 3,704,056.

Adjusta-Post Manufacturing Company: *See—*
Patry, Leon R., 3,704,368.

Agence Katimavik Inc.: *See—*
Sollogoub, Nicolas; and Bloc , Jean A., 3,704,064.

Agence Nationale de Valorisation de la Recherche: *See—*
Paris, Rene A.; Thibaudon, Dominique; Roubin, Marc P.; and Paris, Jacques M., 3,704,116.

Airtex Corporation, mesne: *See—*
Beck, Edward G., Jr., 3,703,758.

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Berlyn, Martin John. Air compressors. 3,704,079, Cl. 417-438.000.

Berry, Currie B., to Ethyl Corporation. Method of making a composite metal article. 3,703,763, Cl. 29-503.000.

Berry, Foster W., to Brunswick Corporation. Bowling pin with cheek elements formed of wood particles and resin binder. 3,704,016, Cl. 273-82.00r.

Bertelsen, Henry Filso. Table extension. 3,703,871, Cl. 108-66.000.

Bertram, Sidney, to Bunker-Ramo Corporation, The, mesne. Light modulating device controlled by a divertable fluid stream. 3,704,058, Cl. 350-160.000.

Bertram, Sidney, to Bunker-Ramo Corporation, The, mesne. Switchable light modulating device. 3,704,059, Cl. 350-160.000.

Bien, Hans-Samuel; Hohmann, Walter; Vollmann, Heinrich; and Heinrich, Leister, to Farbenfabriken Bayer Aktiengesellschaft. Anthraquinone dyes. 3,704,252, Cl. 260-380.000.

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Blattry, Johann; and Beckers, Heinrich, to Forkardt, Paul, Kommanditgesellschaft. Chuck for turning machines. 3,704,022, Cl. 279-121.000.

Bleikamp, Roy H., Jr., to United States of America, Air Force. Arming unit. 3,703,844, Cl. 89-1.50d.

Blevins, Maurice E. Method of translating the location of a predetermined position on one side of a substantially nonferrous structural barrier of a building to an opposite side of said barrier. 3,704,413, Cl. 324-67.000.

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Bodunov, Igor Vasilievich; Modestov, Boris Sergeevich; and Ivanchenko, Viktor Vasilievich, to Severodonetsky Filial Niihimmash. Screw feeder for paste-like materials. 3,704,076, Cl. 415-72.000.

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Bowen, William W., to Du Pont de Nemours, E. I., and Company. Yarn treating jet. 3,703,751, Cl. 28-1.400.

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Bradley, Curtis E. Corrosion resistant battery terminal connector. 3,704,440, Cl. 339-114.000.

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Brown, John P., to United States of America, Air Force. Gel composition and its use as a braking medium. 3,703,942, Cl. 188-33.000.

Brown, Robert Warren, to General Telephone Company of California. Telephone cable restorer system. 3,704,347, Cl. 179-91.00r.

Brown, William B. Pressure sensitive apparatus. 3,703,782, Cl. 43-23.000.

Brown, William L., IV. Fluid pressure engine. 3,703,848, Cl. 91-265.000.

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Burg, Karlheinz; Wolters, Ernst; Cherdron, Harald; and Leugering, Hans-Joachim, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Thermoplastic moulding compositions on the basis of polyoxymethylenes. 3,704,275, Cl. 260-37.0al.

Burke, Francis T. Brake testing tool. 3,703,826, Cl. 73-121.000.

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California Institute of Technology: *See—*
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Calinog, Teodora A. Surgical drainage instrument. 3,703,899, Cl. 128-347.000.

Callan, John E., to Cities Service Company. Self-curing sealant compositions. 3,704,196, Cl. 156-306.000.

Callan, John E., to Cities Service Company. Method of increasing the scorch life of butyl rubber. 3,704,274, Cl. 260-33.6aq.

Canadian Westinghouse Company Limited: *See—*
Parker, Robert E.; Lodge, Malcolm A.; and Jewell, George S., 3,704,372.

Canfield, Dale Kelley: *See—*
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Capuano, Italo A., to Olin Corporation. Total mercury monitor. 3,704,097, Cl. 23-230.00r.

Carborundum Company, The: *See—*
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Cardiac Resuscitator Corporation: *See—*
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Carp, Ralph W.: *See—*
Hickner, George B.; Howard, Donald W.; Houseman, Paul S.; and Carp, Ralph W., 3,704,043.

Carpenter, Mark E.; and Smithgall, Harry E., to GTE Sylvania Incorporated. Cathode ray tube target structure supported by the forward portion of the envelope and having a thermal barrier therein. 3,704,387, Cl. 313-257.000.

Carrier Corporation: *See—*
Mayer, Robert H., 3,704,035.

Carsten, Paul W., to CVC Company. Automatic rate of flow control valve. 3,703,913, Cl. 137-599.000.

Carter, William J., Jr. Ground collar. 3,704,004, Cl. 256-1.000.

Cartner, Jack O. Post driver. 3,703,934, Cl. 173-43.000.

Cassidy, James L. Pressure process for condensing power house stream. 3,703,809, Cl. 60-95.000.

Caterpillar Tractor Co.: *See—*
Karstensen, Karl W.; and Kizer, Richard W., 3,704,075.
Page, Russell D.; Klingaman, Dean C.; and Scholl, Rolland D., 3,703,931.

Cato Oil and Grease Co.: *See—*
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CCI Aerospace Corporation: *See—*
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Cerveny, Daniel H.; Johnson, Perry T.; and Gaston, Donald H. Folding cart. 3,704,025, Cl. 280-41.00a.

Ceskoslovenska akademie ved: *See—*
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Chacon, Raul J.: *See—*
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Chamberlain, Neal C.: *See—*
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Chamberlin, Earl M.: *See—*
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Chemische Werke Huls, A.G.: *See—*
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Chen, Muchuan M.; and Kotheimer, William C., to General Electric Company. Network reclosing relay. 3,704,392, Cl. 317-23.000.

Cherdron, Harald: *See—*
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Chesters, Walter T., to Brown, David, Gear Industries Limited. Method of producing wormwheels. 3,703,756, Cl. 29-159.200.

Chida, Yugo: *See—*
Yamashita, Takashi; Chida, Yugo; Ninagawa, Sadayoshi; and Kato, Tetsuya, 3,704,317.

Cincinnati Butchers' Supply Company, The: *See—*
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Cincinnati Incorporated: *See—*
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Cities Service Company: *See—*
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Callan, John E., 3,704,274.

Cities Service OiCompany: *See—*
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Cities Service Oil Company: *See—*
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Claes, Frans Henri: *See—*
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Clark Equipment Company: *See—*
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Clark, Frank S., to Monsanto Company. Polyphenyl ether lubricating compositions. 3,704,277, Cl. 252-54.600.

Clark, William A.: *See—*
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Clay, Robert A. Rotational molding apparatus. 3,704,084, Cl. 425-404.000.

Clinton, Raymond O., to Sterling Drug Inc. Steroido[3,2-c]pyrazoles and preparation thereof. 3,704,295, Cl. 260-239.5.

Coats, Jesse C. Combination lumber stacker, sticker placer and unloader. 3,703,965, Cl. 214-6.00m.

Coffin, George, to Lucas, Joseph, (Industries) Limited. Testing of semi-conductor devices. 3,704,418, Cl. 324-158.00f.

Cohen, Marvin P.: *See—*
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Cohen, Ronald: *See—*
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Cohn, Nathan, to Leeds & Northrup Company. Load shedding apparatus. 3,704,380, Cl. 307-52.000.

Coker, Cecil Harold; and Umeda, Noriko, to Bell Telephone Laboratories, Incorporated. Conversion of printed text into synthetic speech. 3,704,345, Cl. 179-1.0sa.

Cola, Rudolph A., to Burroughs Corporation. Display panel and method of operating said pane to produce different colors of light output. 3,704,386, Cl. 313-108.00r.

Cole, Judson C., to Continental Industries, Inc. Torque wrench. 3,703,827, Cl. 73-139.000.

Coleman, William E., to National Cash Register Company. Method of making a plasma display panel. 3,704,052, Cl. 316-17.000.

Colgate-Palmolive Company: *See—*
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McHugh, Neil Martin; Scheurman, Clarence, III; and Schulerud, Albert Lyle, 3,703,772.
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Colonial Carbon Company: *See—*
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Combustion Engineering Inc.: *See—*
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Commatic Systems: *See—*
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Commercial Solvents Corporation: *See—*
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Conant, Dale H., to Eastman Kodak Company. Diazo-containing material exhibits an imagewise change in triboelectric charging properties. 3,704,124, Cl. 96-1.00r.

Cone, Richard E.: *See—*
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Conery, William J.; and Kaessen, Donald A., to Hydr-O-Matic Pump Company. Deep well type pump. 3,704,078, Cl. 417-369.000.

Confer, Howard F. Protection apparatus for a vehicle. 3,704,031, Cl. 280-150.00c.

Conrad, Siegfried E.: *See—*
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Continental Industries, Inc.: *See—*
Cole, Judson C., 3,703,827.

Continental Oil Company: *See—*
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Control Technology, Inc.: *See—*
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Converso, Victor E. Recessible fixture support. 3,703,855, Cl. 94-1.500.

Cooner, William W., to Du Ponte de Nemours, E. I., and Company. Progressive burning smokeless powder coated with an organic ester. 3,704,185, Cl. 149-11.000.

Corti, Costante: *See—*
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Cotton, Incorporated: *See—*
Jones, Joseph Kennedy; and Smith, Milton Louis, 3,703,966.

Courbon, Paul, to Charbonnages de France. Humid de-dusting device for gas-conveyor conduits. 3,703,800, Cl. 55-238.000.

Coyer, Robert D.; and Weigel, Robert M.; deceased (by Weigel, Virginia; heiress), to United States of America, Air Force. Survivable telescoping antenna. 3,704,466, Cl. 343-719.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. (1-oxo-2-alkylideneindanyloxy) and (1-oxo-2-alkylideneindanylthio) alkanoic acids. 3,704,314, Cl. 260-520.000.

Crane Co.: *See—*
Kanter, Jerome J., 3,704,153.

Crawford, Donald C., to FMC Corporation. Rotary shear for wrapping machines. 3,703,841, Cl. 83-341.000.

Crawford, John T.: *See—*
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Cross, Grosvenor M. Fluid engine. 3,704,080, Cl. 417-486.000.

Crouch, Thomas J.; and Gynn, George E., to Syncro Corporation. Ignition adapter circuit. 3,704,397, Cl. 317-157.600.

Cuomo, Jerome J.; Mayadas, Ashok F.; and Rosenberg, Robert, to International Business Machines Corporation. Method for improving adhesion between conductive layers and dielectrics. 3,704,166, Cl. 117-217.000.

Cupler, John A., II. Vee machining center. 3,704,073, Cl. 408-1.000.

Curtis Instruments, Inc.: *See—*
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Finger, Eugene P., 3,704,432.

Cushman, Walton W., to Tucker, Martin. Vehicle suspension means. 3,704,026, Cl. 280-87.00r.

CVC Company: *See—*
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Czaja, Robert F.; Grenda, Victor J.; and Chamberlin, Earl M., to Merck & Co., Inc. Synthesis of the biologically active diastereoisomer of (-) zearalanol. 3,704,249, Cl. 260-343.20f.

Dadazynski, Rolf: *See—*
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Bayew, Dimiter; Daeuble, Manfred; Kaufmann, Otto; Ludsteck, Dieter; Pfitzner, Helmut; and Witsch, Heinz-Guenter, 3,704,086.

Dahlgren, Lennart Gunnar Oskar, to Hasselblad, Fritz Victor. Cushioning device for mechanical details in photographic cameras and similar precision apparatus. 3,703,945, Cl. 188-85.000.

Dailey, William H.: *See—*
Nagel, Horst; Thumm, Wilhelm; Garbe, Horst; Dailey, William H.; Goedeke, Egon; and Dadazynski, Rolf, 3,704,088.

Daimler-Benz Aktiengesellschaft: *See—*
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Danfoss A/S: *See—*
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Danna, Vincent F.: *See—*
Walker, Bobby T.; and Danna, Vincent F., 3,703,781.

Daughtry, Wallace B. Carriers frr cups, sandwiches and the like. 3,703,982, Cl. 229-28.000.

Daur, Hans-Karl: *See—*
Van Winsen, Friedrick H.; and Daur, Hans-Karl, 3,703,761.

Davis, Judson S., to General Motors Corporation. Vehicle speed indicator. 3,704,417, Cl. 324-163.000.

Davis, Leo W.; Lackey, Marion D.; Ross, John Reuben; and Trenary, Bryant, to Peerless Mfg. Co. Vehicle for traversing rough terrain. 3,704,040, Cl. 298-17.00r.

Davis, Noel, to Integrated Development and Manufacturing Co. Cold finger dehumidification system. 3,703,814, Cl. 62-95.000.

Davis, William B.: *See—*
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Dawson Carbide Industries: *See—*
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Day, Donald R.: *See—*
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De Boer, Henri G. J.; Brooshooft, Thomas; and Wemmers, Anton, to GAF Corporation. Two component diazotype composition having additionally an aniline compound. 3,704,129, Cl. 96-91.00r.

De Laval Turbine Inc.: *See—*
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De Lavel Separator Company, The: *See—*
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Dean, William H. Truck bed cover. 3,704,039, Cl. 296-137.00b.

Debs, Victor, to Levolor Lorentren, Inc. Venetian blind, installation and method. 3,703,920, Cl. 160-107.000.

Deckas, Peter C., to Dexon, Inc. Clean air work station. 3,703,801, Cl. 55-385.000.

Delalande S.A.: *See—*
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Delong, William T.; Szumachowski, Edwin R.; and Heverly, Harold R. Liquid binding agent for bonded arc welding flux. 3,704,149, Cl. 106-286.000.

Delta Products, Inc.: *See—*
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Demag AG: *See—*
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Dennert, Hans Veit: *See—*
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Dennert, Heinz; and Dennert, Hans Veit. Method and apparatus for expanding clay granules. 3,704,010, Cl. 263-21.00b.

Desborough, Colin Leonard: *See—*
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Deschner, Richard E. Offset feed control. 3,704,074, Cl. 408-11.000.

Deskins, David S.: *See—*
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Dessauer, Rolf, to Du Pont de Nemours, E. I., and Company. Co-irradiation method for producing positive images utilizing phototropic spiropyran or indenone oxide or dual response photosensitive composition. 3,704,127, Cl. 96-48.000.

Devellian, Richard D.: *See—*
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Dexon, Inc.: *See—*
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Diamalt Aktiengesellschaft: *See—*
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Diamond, Julius, to Rorer, William H., Inc. P-cycloalkylphenylglycolic acid and derivatives therefor. 3,704,313, Cl. 260-520.000.

Diamond Laboratories, Inc.: *See—*
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Diebold, James L.: *See—*
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Wolfe, Milton; Diebold, James L.; Russell, Peter B.; and Bell, Stanley C., 3,704,292.

Dietzsch, Hans-Joachim; and Dietzsch, Otto. Electrodialysis apparatus with capillary exchanger. 3,704,223, Cl. 204-301.000.

Dietzsch, Otto: *See—*
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Digney, Frank J., Jr.; and Phinney, Earl M. Capacitor discharge type blasting machines. 3,704,393, Cl. 317-80.000.

Dille, Kenneth L.: *See—*
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Dillon, Janus J., to Food Equipment, Inc. Fowl singeing system. 3,703,744, Cl. 17-11.000.

Dixon, Rolland E.; and Sherk, Fred T., to Phillips Petroleum Company. Hydrocarbon conversion. 3,704,334, Cl. 260-683.430.

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Bardwell, Francis G.; Dobrauz, John W.; and Sobchak, Frank L., 3,704,373.

Dorey, Albin E. Safety lock. 3,703,821, Cl. 70-38.00r.

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Dougherty, William R., to Honeywell Inc. Liquid quantity gaging system. 3,703,829, Cl. 73-290.00r.

Douglass, Frank Irvin, to AMP Incorporated. Panel mounted electrical terminal. 3,704,441, Cl. 339-220.00t.

Douty, Donald L., to United States Steel Corporation. Can end with banded seal slide. 3,703,979, Cl. 221-484.000.

Dow Chemical Company, The: *See—*
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Downs, Dan Lloyd, to Minnesota Mining and Manufacturing Company. Ski with cut-resistant surface covering. 3,704,023, Cl. 280-11.13l.

Drane, Charles J., Jr.; and McIlvenna, John F., Jr., to United States of America, Air Force. Method of suppressing selected antenna radiation pattern side lobes while retaining maximum directive gain. 3,704,464, Cl. 343-100.01e.

Du Pont de Nemours, E. I., and Company: *See—*
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Dulat, Joseph, to United States Borax & Chemical Corporation. Ceramic whiteware compositions comprising a borate flux. 3,704,146, Cl. 106-45.000.

Dunks, Clifford M.; and McCaulay, James L., to Materials and Methods Limited. Process for the manufacture of nodular cast iron. 3,703,922, Cl. 164-57.000.

Dunlop Company Limited, The: *See—*
Osborne, Denis A. N.; Haines, Robert C.; and Kilshaw, John A., 3,703,824.

Dvonch, William; and Alburn, Harvey E., to American Home Products Corporation. 7-(1,4-cycloh exadienylacylamido) cephalosporanic acids and related compounds. 3,704,297, Cl. 260-243.00c.

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Eckert, George W.: *See—*
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Eckert, Hans-Werner; and Perner, Johannes Jurgen, to Henkel & Cie G.m.b.H. Washing agents containing a textile softener. 3,704,228, Cl. 252-117.000.

Eckert, Konrad; and Knapp, Heinrich, to Bosch, Robert, GmbH. Device for the fuel quantity control in response to operational variables of an internal combustion engine. 3,703,888, Cl. 123-119.00r.

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Edutek Systems Corporation: *See—*
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Edwards, Everett. Method for preparing animals for slaughter. 3,703,745, Cl. 17-45.000.

Eggert, Walter S., Jr., to Boothe airside Services, Inc., mesne. Canopy apparatus. 3,703,737, Cl. 14-71.000.

Eguchi, Fusatoshi; Okamoto, Sohei; Yamaha, Mashio; Matsumoto, Nobuo; and Yokoyama, Minoru, to Ebara Infilco Kabushiki Kaisha. Sludge hydroextractor. 3,703,963, Cl. 210-386.000.

Eich, Eckart; and Rochelmeyer, Hans, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. O-Acyl-lysergols and process for preparing them. 3,704,233, Cl. 260-285.500.

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El-Mogazi, Mohamed M.; and Rai, Charanjit, to Cities Service Oil Company. Process for recovery of para-xylene from mixtures of meta and para-xylene. 3,704,330, Cl. 260-674.00a.

Electric Machinery Mfg. Company: *See—*
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Electro Connective Systems, Inc.: *See—*
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Ellcon-National, Inc.: *See—*
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Elliott, Brian J.; and Staples, John L., to International Business Machines Corporation. Sequential sampling system. 3,704,416, Cl. 324-121.00r.

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Enomoto, Koji: *See—*
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Enomoto, Sigeharu; Sato, Katsunobu; and Suzuki, Goichi, to Sumitomo Chemical Co., Ltd. Certain cumarin quinazolinones. 3,704,302, Cl. 260-256.40q.

Epina, August P.; and Pearson, Paul O., to Storage Technology Corporation. Door construction in a magnetic tape drive system. 3,703,997, Cl. 242-182.000.

Erb, Brian Richard, to Hurtsteel Products Ltd. Drilling apparatus. 3,703,909, Cl. 137-318.000.

Erickson, Lennart G. Sprinkler irrigation apparatus and method. 3,703,990, Cl. 239-11.000.

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Ethyl Corporation: *See—*
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Eustis, William E. C.; and Howell, Wallace E., to Hedco, Inc. Snow precipitator. 3,703,991, Cl. 239-2.00s.

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Farmer, William M., to United States of America, Air Force. Electrostatic spatial filter for a high power laser. 3,704,053, Cl. 350-17.000.

Farney, Leonard C.: *See—*
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Fauran, Claude P.; Turin, Michel J.; Raynaud, Guy M.; and Pourrias, Bernard M., to Delalande S.A. N-(α-Phenylpropyl)-n'-(substituted)-piperazines. 3,704,305, Cl. 260-268.00r.

Fay, Lawrence P.: *See—*
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Feistel, Robert B., Jr., to HSH, Inc. Earth scraper. 3,703,776, Cl. 37-9.000.

Feller, Fritz. Rotary piston internal combustion engines. 3,703,885, Cl. 123-8.110.

Feuer, Robert, to Aqua Treatment Industries, Inc. Rotary biological flow-through filter. 3,703,961, Cl. 210-151.000.

Fiala, Ernst, to Wolf-Dieter Klink. Actuating means for inflating a vehicular crash-pad. 3,704,032, Cl. 280-150.0ab.

Fiber Industries, Inc.: *See—*
Binford, Jack C.; Ethridge, Frederick A.; and Talbot, James R., 3,703,753.
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Findley, Thomas W.: *See—*
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Finger, Eugene P., to Curtis Instruments, Inc. Capacitive coulometer improvements. 3,704,432, Cl. 331-183.000.

Finn, John B.; and Hudecek, Carl J. Electrically conductive surface. 3,704,110, Cl. 65-32.000.

Fiore, Jack C.; and Tennerstedt, M. Richard, to Motorola, Inc. Multi-band memory assembly. 3,704,424, Cl. 325-470.000.

Fischer, Adolf; Becke, Friedrich; and Kohlhaupt, Reinhold, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Chloral compounds. 3,704,310, Cl. 260-482.00c.

Fischer, John L.: *See—*
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Kuhn, Kenneth G.; and Chamberlain, Neal C., 3,703,952.
Lind, Willard M., 3,703,762.
Lofstrand, Wilton S.; and Montgomery, John G. (said Lofstrand assor. to), 3,703,930.
Wilson, Donald C., 3,704,139.

Foley, Edward F., Jr.; Tsai, Shan-Pu; and Zatorsky, William A., to Du Pont de Nemours, E. I., and Company, mesne. Catalyst solution for electroless plating on nonconductors. 3,704,156, Cl. 117-47.00a.

Fontaine, John G. Composite seat and switch. 3,704,352, Cl. 200-85.00r.

Food Equipment, Inc.: *See—*
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Forbro Design Corporation: *See—*
Nercessian, Sarkis, 3,704,381.

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Forys, Edward Louis; Lofftus, Leroy A.; Malueg, Richard Milton; and Montalbano, Albert F., to Actron Industries, Inc. Wide band stabilizer. 3,703,999, Cl. 248-20.000.

Foster, John R.; and Hunt, Larry R., to Von Duprin, Inc. Torque resisting axle assembly. 3,703,741, Cl. 16-112.000.

Fournier, Roger, to Regie Nationale des Usines Renault and Automobiles Peugeot. Acid coppering bath. 3,704,213, Cl. 204-52.00r.

Franck, Heinz-Gerhard: *See—*
Buffleb, Herbert; Franck, Heinz-Gerhard; Turowski, Johannes; Collin, Gerd; and Zander, Maximilian, 3,704,331.

Frank, Eli C.: *See—*
Boxer, Leo M.; and Boxer, Robert W., 3,703,974.

Frank, Stanley William. Self-contained alarm lock with tamper-proof interlocked casing formed from extrusion. 3,704,460, Cl. 340-274.000.

Freake, Ronald; Gunter, Claude Ray; Haden, Billy Harper; and Mhatre, Nagesh Shamrao, to Miles Laboratories, Inc. Device for the detection of bacteria in aqueous fluids. 3,704,206, Cl. 195-127.000.

Freeman, Harlan G.; and Gillern, Maurice F., to Weyerhaeuser Company. Foams and process of making. 3,704,269, Cl. 260-2.50f.

Freisler, Erhard, to Ruti Machinery Works Ltd.; formerly Caspar Honegger. Roll arrangement for a textile machine. 3,703,914, Cl. 139-308.000.

Frey, James O.; Marshall, Harry L.; and Minnier, Henry B., to GTE Sylvania Incorporated. Preparation of sulfide phosphors. 3,704,232, Cl. 252-301.60s.

Freyermuth, Harlan B.; and Randall, David I., to GAF Corporation. N-(Substituted sulfonylmethyl)-2-pyrrolidinones. 3,704,243, Cl. 260-326.5sf.

Frock, Brian G., to National Cash Register Company, The. Reversible record and storage medium. 3,704,467, Cl. 346-1.000.

Froebe, Ronald L.; and Hatch, Howard H., to Bourns, Inc. Multi-wire potentiometer contact device. 3,704,436, Cl. 338-202.000.

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Fujita, Mitsuo, to Victor Company of Japan, Limited. Color video signal recording and reproducing system. 3,704,341, Cl. 178-5.20r.

Fukino, Katsushige, to Nippon Electric Co., Ltd. Multi-emitter power transistor having emitter region arrangement for achieving substantially uniform emitter-base junction temperatures. 3,704,398, Cl. 317-235.00r.

Fulford, Richard S., to Cities Service OiCompany. Oil recovery utilizing acidic organic phosphate scale inhibitors. 3,703,928, Cl. 166-275.000.

Fyanes, Robert V. Board game apparatus. 3,704,018, Cl. 273-134.0ab.

GAF Corporation: *See—*
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Freyermuth, Harlan B.; and Randall, David I., 3,704,243.
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Galloway, Dwight V.; King, Gordon E.; Asbelle, Charles C.; and Arrigo, Michael F., to United States of America, Navy. Rigid foam polyurethane hand splint. 3,703,894, Cl. 128-77.000.

Ganter, Wolfgang; Otto, Heinz; and King, Josef, to Gebruder Junghans G.m.b.H. Electric timepiece with date dial. 3,703,805, Cl. 58-5.00r.

Garbe, Horst: *See—*
Nagel, Horst; Thumm, Wilhelm; Garbe, Horst; Dailey, William H.; Goedeke, Egon; and Dadazynski, Rolf, 3,704,088.

Garmire, Gordon, to California Institute of Technology. X-ray position detector. 3,704,284, Cl. 250-83.60r.

Garofalo, Frank: *See—*
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Garrison, Jedediah Lyman; and Georgiades, Andrew Nicholas, to Bell Telephone Laboratories, Incorporated. Band-elimination filter. 3,704,433, Cl. 333-72.000.

Gas council, The: *See—*
Nicklin, Thomas, 3,704,095.

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Gatti, Joseph. Football boots. 3,703,775, Cl. 36-2.5ag.

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General Motors Corporation: *See—*
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General Telephone Company of California: *See—*
Brown, Robert Warren, 3,704,347.

Georgiades, Andrew Nicholas: *See—*
Garrison, Jedediah Lyman; and Georgiades, Andrew Nicholas, 3,704,433.

Gerlach, John R., to Emhart Corporation. Thumb lever actuated latch operating device. 3,704,036, Cl. 292-167.000.

Gessler, Hans, to Schwabische Huttenwerke Gesellschaft mit beschrankter Haftung. Rotor arm for silo discharging devices. 3,703,967, Cl. 214-17.00d.

Geus, John W., to Stamicarbon N.V. Process for the preparation of permanently magnetizable mixed oxides containing iron. 3,704,226, Cl. 252-62.560.

Gevaert-Agfa N.V.: *See—*
Pollet, Robert Joseph; Philippaerts, Herman Adelbert; Willems, Jozef Frans; and Claes, Frans Henri, 3,704,130.

Giannini, Mario, to Malesci S.A.S. Istituto Farmacobiologico. N-Alkyl-n'-(1-naphthoyl) ethylene diamines. 3,704,322, Cl. 260-558.00r.

GIB Precision Limited: *See—*
Orwin, Olaf John Barclay, 3,703,817.

Gibb, Thomas B., Jr.: *See—*
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Gilbertson, Warren L.; Shelton, Everett T., Jr.; and Southall, Hobert M., to United States of America, Navy. Electronically controlled aimed blast warhead. 3,703,865, Cl. 102-56.000.

Gillern, Maurice F.: *See—*
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Gillett, Jimmie Douglas, to Electric Machinery Mfg. Company. Power supply circuit to simultaneously vary frequency and amplitude in a motor speed control. 3,704,403, Cl. 318-227.000.

Gillette Company, The: *See—*
Nigro, Louis V., 3,703,994.
Perry, Roger L., 3,703,764.

Girard, Peter F., to Teledyne Ryan Aeronautical Company. Drone aircraft with telescopic fuselage. 3,703,998, Cl. 244-13.000.

Girling Limited: *See—*
Ingram, Brian; Harries, David A.; and Phoenix, Lancelot, 3,704,044.

Giuiuzza, Pietro, to O.M.C.S.A. Officine Meccaniche Cigardi S.p.A. Disconnect arrangement for multi-unit printing press. 3,703,863, Cl. 101-183.000.

Glaise, Rene, to U.S. Philips Corporation. Semiconductor device and circuit arrangement comprising the device. 3,704,399, Cl. 317-235.00r.

Glanemann, Rudolf, to Eckert, Paul. Negative pressure lift device. 3,704,038, Cl. 294-65.000.

Glassberg, Bernard. Articulated door protector. 3,704,037, Cl. 293-1.000.

Glassman, Irvin: *See—*
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Glenn, Robert: *See—*
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Goldman, Allan. Translucent sign. 3,703,779, Cl. 40-135.000.

Gomez, Juan Francisco Zendejas. Permanent, safety, inner doors for freight cars. 3,703,787, Cl. 49-169.000.

Goodrich, B. F., Company, The: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
Bucher, Robert W., 3,704,190.

Gorman, Jeremy W., to Loctite Corporation. Encapsulation of monomeric materials. 3,704,264, Cl. 252-316.000.

Goshen, Randal W.: *See—*
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Goshi Kaisha Yoshikawa Seimitsu Kohsakusho: *See—*
Yoshikawa, Kengi; and Hayashi, Etsuo, 3,704,048.

Goshima, Takeshi, to Canon Kabushiki Kaisha. Magnetic recording reproducing device capable of automatic repetitive reproduction. 3,703,774, Cl. 35-35.00c.

Goshima, Takeshi; and Kohtani, Yutaka, to Canon Kabushiki Kaisha. Magnetic recording system. 3,704,349, Cl. 179-100.20r.

Goshima, Takeshi; and Kohtani, Yutaka, to Canon Kabushiki Kaisha. Apparatus for controlling the tension of a magnetic tape. 3,704,400, Cl. 318-6.000.

Gotshall, William W., to Marathon Oil Company. Process for the preparation of elastomeric composition containing methanol treated carbon black. 3,704,276, Cl. 260-41.50r.

Grace, W. R., & Co.: *See—*
Ketley, Arthur Donald; Kehr, Clifton Leroy; and Touchette, Jennie Lee, 3,704,125.
Woodruff, Edward T.; and Andersen, Viggo S., 3,704,169.

Gracon, Andrew; and Tinnerman, George A., said Gracon assor. to said Tinnerman, George A. Structural retainer clip. 3,703,794, Cl. 52-506.000.

Grahame, Frederick W. Combined capacitor-inductor reactor device having transformer characteristics. 3,704,390, Cl. 315-276.000.

Gravoki Systems Limited, mesne: *See—*
Roberts, George Wavell, 3,703,852.

Gray, John C.: *See—*
Yarlott, John M.; and Gray, John C., 3,703,842.

Green, Clifford L. Incinerator. 3,703,732, Cl. 4-131.000.

Greiner, James G.; and Brelsford, John E., to Sperry Rand Corporation. Farm wagon frame. 3,704,028, Cl. 280-106.00t.

Grenda, Victor J.: *See—*
Czaja, Robert F.; Grenda, Victor J.; and Chamberlin, Earl M., 3,704,249.

Griew, David Charles Lambert. Small arms weapon and small arms ranges. 3,703,845, Cl. 89-134.000.

Griffiths, Leonard B.; and Shen, Yuan-Shou, to Mallory, P. R., & Co., Inc. Nickel-chromium-beryllium alloy. 3,704,182, Cl. 148-32.000.

Grosselfinger, Horst: *See—*
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Grossman, Sidney. Variable capacity broiling equipment. 3,704,141, Cl. 99-397.000.

Grout, Kenneth M.; and Devellian, Richard D., to Kenics Corporation. Dispersion production method. 3,704,006, Cl. 259-4.000.

Grunig, James K.; Davis, William B.; and Aitkenhead, William C., to Anaconda Company, The. Extraction of beryllium from ores. 3,704,091, Cl. 423-128.000.

GTE Sylvania Incorporated: *See—*
Carpenter, Mark E.; and Smithgall, Harry E., 3,704,387.
Frey, James O.; Marshall, Harry L.; and Minnier, Henry B., 3,704,232.

Gudmestad, Ragnar, to Artos Engineering Company. Conveyor system for wire like articles. 3,703,954, Cl. 198-179.000.

Guensche, Oscar M., to Dawson Carbide Industries. Adjustable tool holder for precisely repositioning reground cutter inserts. 3,703,755, Cl. 29s96.000.

Guerrini, Camillo. Journal lubricator. 3,704,049, Cl. 308-84.000.

Gunter, Claude Ray: *See—*
Freake, Ronald; Gunter, Claude Ray; Haden, Billy Harper; and Mhatre, Nagesh Shamrao, 3,704,206.

Gunvalson, Robert N. Boat mooring device. 3,703,875, Cl. 114-230.000.

Guthrie, Charles I. Rearview mirror device. 3,704,063, Cl. 350-302.000.

Gutmann, Alfred, Gesellschaft fur Maschinenbau: *See—*
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Haden, Billy Harper: *See—*
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Haft, Peter, to Knitting Specialty Machinery Corporation, mesne. Fabric handling apparatus. 3,703,882, Cl. 118-32.000.

Haggerty, John S.; and Wenckus, Joseph F., to Little, Arthur D., Inc. Method of synthesizing intermetallic compounds. 3,704,093, Cl. 423-299.000.

Hahn, Hans Helmut: *See—*
Pretorius, Victor; and Hahn, Hans Helmut, 3,703,798.

Haigh, Geoffrey T., to Particle Data Inc. Compression/expansion techniques for time varying signals. 3,704,425, Cl. 328-145.000.

Haines, Robert C.: *See—*
Osborne, Denis A. N.; Haines, Robert C.; and Kilshaw, John A., 3,703,824.

Haldex Aktiebolag: *See—*
Berg, Kjell Willy, 3,703,985.

Hale, Douglas; Manuel, James C.; and Beck, Nicholas R., to Ralston Purina Company. Method of preparing a fabricated skin from poultry meat and skin and product produced thereby. 3,704,135, Cl. 99-108.000.

Hall, Jack G. Rhythm traps. 3,704,340, Cl. 84-170.000.

Halla, Richard C., to Teletype Corporation. Alternate action mechanism with magnetic latch cam follower biasing means. 3,704,353, Cl. 200-153.00j.

Hamer, William J.; and Goshen, Randal W. Aircraft electronic apparatus with supporting rack. 3,704,395, Cl. 317-120.000.

Hamman, Denver C., to Illinois Tool Works Inc. Molding clip. 3,703,747, Cl. 24-73.0hs.

Hampton, Richard J.; Rolland, Jacques R.; and Gallo, Thomas, to Ogilvie Flour Mills Company, Limited, The. Readily dispersible dry gluten product, processes for making it, and uses thereof. 3,704,131, Cl. 99-17.000.

Hanaoka, Takemi; Kakehashi, Toshiro; Toyomasu, Ryota; and Yata, Tomio, to Ajinomoto Co., Inc. Preparation of amino acids by hydrolysis of bacterial cells obtained by fermentation. 3,704,316, Cl. 260-527.00n.

Hand, John W.; Lockwood, Don L.; and Harris, Robert K., to Mintech Corporation. Discharge mechanism for shaft kiln. 3,704,011, Cl. 263-29.000.

Hanna Mining Company, The: *See—*
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Hara, Kazuo; Samoto, Mistunobu; Sawai, Masanobu; and Nakamura, Shiro, to Teikoku Hormone Mfg. Co., Ltd. and Japan Chemurgy Co., Ltd. Process for the crystallization of glucose, fructose, or mixture of glucose and fructose. 3,704,168, Cl. 127-58.000.

Hardtmann, Goetz E., to Sandoz-Wander, Inc. Imidazo (2,1-A) phthalazines. 3,704,300, Cl. 260-250.00a.

Hardway, Edward V., Jr., to Spearhead, Inc. Method and apparatus for determining work of breathing. 3,703,893, Cl. 128-2.080.

Hardy, Clarence James; and Holdoway, Michael Joseph, to United Kingdom Atomic Energy Authority. Fibrous inorganic materials. 3,704,147, Cl. 106-55.000.

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Harris, Robert K.: *See—*
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Harrison, Maurice Clark; and Vancil, Donald Otis, to Reynolds Metals Company. Manufacture of N F/A1F double salt. 3,704,092, Cl. 423-465.000.

Harry, Robert Y., to Cities Service Oil Company. Waterflood stabilization for paraffinic crude oils. 3,703,927, Cl. 166-272.000.

Hart, Frederick M.: *See—*
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Harter, Robert M., to AVM Corporation. Valve assembly with integral inlet tube and saddle. 3,704,003, Cl. 251-312.000.

Hartmann, Hans Joerg; Schnell, Georg; Werst, Gerhard; Grosselfinger, Horst; Hartmann, Job-Werner; and Bipp, Hansjoerg, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Magnetic recording media. 3,704,152, Cl. 117-235.000.

Hartmann, Job-Werner: *See—*
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Heatherwill Company: *See—*
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Heck, Joseph G.; and Hill, Warner M., to Armour and Company. Test medium and method for the detection of salmonella. 3,704,204, Cl. 195-150.000.

Hedco, Inc.: *See—*
Eustis, William E. C.; and Howell, Wallace E., 3,703,991.

Heggem, Howard W.: *See—*
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Heinrich, Leister: *See—*
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Heinze, Gerhard: *See—*
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Heitmann, William E.; and Garofalo, Frank, to Inland Steel Company. Method for producing tough, high strength steel article. 3,704,180, Cl. 148-12.000.

Helasti, Olavi Erland. Method for making lignin containing groundwood by hydrolysis and alkali treatment of wood chips. 3,704,201, Cl. 162-19.000.

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Hendrickson, Paul G., to Kelsey-Hayes Company. Disk parking and service brake having servo action on parking brake only. 3,703,944, Cl. 188-72.200.

Henkel & Cie G.m.b.H.: *See—*
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Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Erol ether intermediates for juvenile hormones and analogs. 3,704,258, Cl. 260-410.90r.

Herbes, William Frank: *See—*
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Herbst, John A., to Bogue Electric Manufacturing Company. Frequency meter. 3,704,414, Cl. 324-79.00d.

Hercules Incorporated: *See—*
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Taylor, Robert S., 3,704,090.

Heywang, Walter, to Siemens & Halske Aktiengesellschaft. Device for simulating emission of radiation from a diode. 3,704,427, Cl. 331-94.500.

Hickner, George B.; Howard, Donald W.; Houseman, Paul S.; and Carp, Ralph W., to Bendix Corporation, The. Adaptive braking control system. 3,704,043, Cl. 303-21.0be.

Higgs, William York, to Star Lifeline Limited. Anchoring device for buoyant life saving equipment. 3,703,736, Cl. 9-9.000.

Hildreth, Clarence L., to Ethyl Corporation. Chloridizing alumina-containing ore. 3,704,113, Cl. 75-1.000.

Hill, Bryan H. Process for forming a p-n junction in a semiconductor material. 3,704,178, Cl. 148-1.500.

Hill, Warner M.: *See—*
Heck, Joseph G.; and Hill, Warner M., 3,704,204.

Hill, William H., to Peter, Strong & Company, Inc. Denture cleansers. 3,704,227, Cl. 252-95.000.

Hinderer, Rolf, to Hinderer, Rolf, GmbH. Trousers with adjustable waist. 3,703,729, Cl. 2-237.000.

Hinderer, Rolf, GmbH: *See—*
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Hodge, Edward B., to Commercial Solvents Corporation. Zearalenone reduction. 3,704,248, Cl. 260-343.20f.

Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
Bauer, Friedrich; and Kohler, Robert, 3,703,912.

Hoffmann-La Roche Inc.: *See—*
Uskokovic, Milan Radoje, 3,704,324.

Hoganas AB: *See—*
Wastenson, Erik Goran; and Bockstiegel, Georg Heinrich Artur Gerhard, 3,704,115.

Hohmann, Walter: *See—*
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Holdoway, Michael Joseph: *See—*
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Holmes, David Alan, to Du Pont de Nemours, E. I., and Company. Concentration of polytetrafluoroethylene aqueous dispersion. 3,704,272, Cl. 260-29.60f.

Holovka, Charles, Jr.; Demchyshyn, Bohdan; and McHugh, John Francis, to International Business Machines Corporation. Apparatus and method for mounting cards on a web. 3,704,015, Cl. 270-52.000.

Holtschmidt, Hans: *See—*
Zecher, Wilfried; Kuhle, Engelbert; and Holtschmidt, Hans, 3,704,307.

Holznagel, Melvin A., to Cardiac Resuscitator Corporation. Cardiac resuscitator. 3,703,900, Cl. 128-419.00p.

Honeycutt, Don R., to Redman Industries, Inc., mesne. Hydraulic control system. 3,703,850, Cl. 91-446.000.

Honeywell Inc.: *See—*
Dougherty, William R., 3,703,829.

Hong, Sung Kul. Projection screen. 3,704,055, Cl. 350-128.000.

Honjo, Satoru; Watarai, Syu; and Ono, Hisatake, to Fuji Photo Film Co., Ltd. Electrophotographic process using toner of same refractive index as organic photoconductive layer. 3,704,119, Cl. 96-1.00r.

Hoover Company, The: *See—*
Knapp, Robert S., 3,703,777.

Horeschi, Giancarlo: *See—*
Barozzi, Gian Piero; and Horeschi, Giancarlo, 3,703,986.

Horii, Kazuo: *See—*
Ueoka, Hisayoshi; Horii, Kazuo; Umeya, Kazumasa; and Maruyama, Syunsuke, 3,704,266.

Horikiri, Toshihiko; and Tsuji, Ryuta, to Kabushikikaisha Tokyo Keiki (Tokyo-Keiki Co., Ltd.). Reducing valv. 3,703,911, Cl. 137-491.000.

Horikoshi, Akira: *See—*
Koda, Ken'Ichi; Kikuchi, Shoji; Wada, Tsuneo; Kuwabara, Yoshimi; Horikoshi, Akira; Tanimura, Kensaku; and Sugita, Sadao, 3,704,128.

Hottle, Dwight E. Segmented tire mold having hinged arcuate tread sectors. 3,704,082, Cl. 425-46.000.

Hou, Joseph P.; and Poole, John W., to American Home Products Corporation. 6-(1-Substituted aminocycloalkanecarboxamido)-penicillanic acid and salts. 3,704,290, Cl. 260-239.100.

Houseman, Paul S.: *See—*
Hickner, George B.; Howard, Donald W.; Houseman, Paul S.; and Carp, Ralph W., 3,704,043.

Howard, Donald W.: *See—*
Hickner, George B.; Howard, Donald W.; Houseman, Paul S.; and Carp, Ralph W., 3,704,043.

Howard, Lawrence K. Character generator. 3,704,343, Cl. 178-30.000.

Howard, Robert; Robinson, Prentice I.; and Menhennett, Herbert E., to Centronics Data Computer Corporation. High-speed printer. 3,703,949, Cl. 197-1.00r.

Howell, Wallace E.: *See—*
Eustis, William E. C.; and Howell, Wallace E., 3,703,991.

HSH, Inc.: *See—*
Feistel, Robert B., Jr., 3,703,776.

Hudecek, Carl J.: *See—*
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Hughes, John Barry, to U.S. Philips Corporation. Associative storage element. 3,704,456, Cl. 340-173.0am.

Hughes, William L.; Allison, Hansel J.; and Ramakumar, Ramachandra G., to Oklahoma State University. High pressure storage vessel. 3,703,976, Cl. 220-3.000.

Huhn, Dieter Karl Wilhelm. Double acting rotary mechanical seal. 3,704,020, Cl. 277-62.000.

Humphreys, Wendell Lewis. Discharge electrode tensioning means. 3,703,799, Cl. 55-147.000.

Hunt, Larry R.: *See—*
Foster, John R.; and Hunt, Larry R., 3,703,741.

Hunter, William Allan, to Heatherwill Company. Method and apparatus for caing in molds radially displaced on rotating table. 3,703,921, Cl. 164-130.000.

Huntzinger, Gerald O., to General Motors Corporation. Bistable throttle control system. 3,704,382, Cl. 307-233.000.

Hurtsteel Products Ltd.: *See—*
Erb, Brian Richard, 3,703,909.

Hutchins, Samuel F. Apparatus for measuring and indicating the angular position of an antenna. 3,704,449, Cl. 340-198.000.

Hutchinson, William Y.; and Kushmuk, Walter P., to Continental Scale Corporation. Weighing scale with concealable dial. 3,703,935, Cl. 177-124.000.

Huthsing, Charles K., Jr.; deceased (Huthsing, N. Evelyn; executor). Pressure indicator. 3,703,879, Cl. 116-70.000.

Huthsing, N. Evelyn: *See—*
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Hydr-O-Matic Pump Company: *See—*
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Hydro Tech Services, Inc.: *See—*
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Hydro-Vel Services, Inc.: *See—*
Ice, Charleso., Jr., 3,703,905.

Hydrocarbon Research Inc.: *See—*
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I-T-E Imperial Corporation: *See—*
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McConnell, Lorne D., 3,704,391.

Ice, Charleso., Jr., to Hydro-Vel Services, Inc. Heat exchanger cleaning system. 3,703,905, Cl. 134-144.000.

ICI America Inc.: *See—*
Shay, Barry Michael, 3,704,225.

Ideboen, John: *See—*
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Ifield, Richard Joseph; and Ifield, William Robert. Hydraulic actuator. 3,703,851, Cl. 92-33.000.

Ifield, William Robert: *See—*
Ifield, Richard Joseph; and Ifield, William Robert, 3,703,851.

Ikeda, Kazuhiko, to National Cash Register Company, The. Keyboard locking device. 3,703,987, Cl. 235-26.000.

Illinois Tool Works Inc.: *See—*
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Immel, Richard H., to Sinclair-Koppers Company. Vacuum mold for making foamed polymeric articles. 3,704,081, Cl. 425-4.000.

Imperial Chemical Industries Limited: *See—*
Bowden, Roy Dennis, 3,704,238.

Imperial Tobacco Company (of Great Britain and Ireland) Limited, The: *See—*
Sargrove, John Adolph, 3,703,902.

Inacker, Edward C. Multiple compartment dispensing box. 3,703,955, Cl. 206-42.000.

Inagaki, Tatsumi: *See—*
Kodama, Yutaka; Takai, Akira; and Inagaki, Tatsumi, 3,704,335.

Inamorato, Jack Thomas, to Colgate-Palmolive Company. Ternary foam control composition and built anionic detergent composition containing same. 3,704,267, Cl. 252-524.000.

indsey, James M., to Sperry Sun Well Surveying Company. Gyro servo control system and structure. 3,704,406, Cl. 318-648.000.

Industrie-Werke Karlsruhe Aktiengesellschaft: *See—*
Madlener, Paul; and Pecksen, Otto, 3,703,867.

Information Transfer Corporation: *See—*
Sims, John C., Jr.; and Brace, Lloyd D., Jr., 3,704,337.

Ingram, Brian; Harries, David A.; and Phoenix, Lancelot, to Girling Limited. Actuator assemblies for hydraulic braking systems. 3,704,044, Cl. 303-21.00f.

Inland Steel Company: *See—*
Heitmann, William E.; and Garofalo, Frank, 3,704,180.

Inoue, Kiyoshi; Ishikawa, Tetsuo; and Okada, Shingo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Automatic packing and wrapping apparatus. 3,703,796, Cl. 53-180.000.

Integrated Development and Manufacturing Co.: *See—*
Davis, Noel, 3,703,814.

Internal Pipeline Services, Inc.: *See—*
Landrum, Ira T., 3,703,947.

International Business Machines Corporation: *See—*
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Inventors and Investors, Inc.: *See—*
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Ireland, Robert G.; Mas, Fred L.; and Teeguarden, Ross W., to Stewart-Warner Corporation. Heat exchanger core. 3,703,925, Cl. 165-151.000.

Irwin, Charles B., Jr. Means for attaching goggles to helmets. 3,703,750, Cl. 24-265.00r.

Ishikawa, Tetsuo: *See—*
Inoue, Kiyoshi; Ishikawa, Tetsuo; and Okada, Shingo, 3,703,796.

Ismail, Roshdy, to Dynamit Nobel Aktiengesellschaft. Production of halogen-containing polyaryl ester. 3,704,279, Cl. 260-61.000.

Itoh, Akira. Cord hangers for hoist. 3,704,350, Cl. 191-12.00r.

Ivanchenko, Viktor Vasilievich: *See—*
Bodunov, Igor Vasilievich; Modestov, Boris Sergeevich; and Ivanchenko, Viktor Vasilievich, 3,704,076.

Iversen, Kristian, to Danfoss A/S. Regulating means. 3,704,404, Cl. 318-290.000.

Jackson, George E., to Union Carbide Corporation. Foundation garment and method of making same. 3,703,820, Cl. 66-177.000.

James, Darrell R.: *See—*
Olevitch, Albert; and James, Darrell R., 3,703,813.

Jamieson, Ian K. Portable device for testing electrical appliances. 3,704,411, Cl. 324-53.000.

Jamison, Saunders Eliot: *See—*
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Japan Chemurgy Co., Ltd.: *See—*
Hara, Kazuo; Samoto, Mistunobu; Sawai, Masanobu; and Nakamura, Shiro, 3,704,168.

Jeskey, Gerald Vernon: *See—*
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Johann Borgers KG, Firma: *See—*
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Johansson, Bengt; and Nilsson, Erland, to Allmanna Svenska Elektriska Aktiebolaget. Spark gap for surge diverters. 3,704,388, Cl. 315-36.000.

Johansson, Karl Bertil Sune: *See—*
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Johnson, Lennart B., to Teradyne, Inc. Receptacle for printed circuit structures with bus bar mounting means. 3,704,394, Cl. 317-101.0dh.

Johnson, Perry T.: *See—*
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Johnson, Philip M.; Dudevoir, Wilfried G.; and Northrup, Richard M., wSanders Associates, Inc. Direction determining system. 3,704,070, Cl. 356-152.000.

Johnson, Robert Norman, to Union Carbide Corporation. High temperature reduced catalyst and process. 3,704,287, Cl. 260-94.9da.

Joly, Jean: *See—*
Blanc, Charles; and Joly, Jean, 3,703,754.

Jones, John M., Jr. Apparatus for processing shrimp and related shellfish. 3,703,746, Cl. 17-71.000.

Jones, Joseph Kennedy; and Smith, Milton Louis, to Cotton, Incorporated. Seed cotton stacking apparatus. 3,703,966, Cl. 214-9.000.

Joosten, Wesley L.: *See—*
Bullard, Edwin R., Jr.; and Joosten, Wesley L., 3,703,828.

Judd, Claude I.: *See—*
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Kabushiki Kaisha Suwa Seikasha: *See—*
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Kabushikikaisha Tokyo Keiki (Tokyo-Keiki Co., Ltd.): *See—*
Horikiri, Toshihiko; and Tsuji, Ryuta, 3,703,911.

Kadron, Stanley F.; Eisenhauer, Gary L.; Pryor, David J.; and Chacon, Raul J., to Bendix Corporation, The. ADF with remote digital tuning. 3,704,423, Cl. 325-458.000.

Kaessen, Donald A.: *See—*
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Kaieda, Nobuo: *See—*
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Kakehashi, Toshiro: *See—*
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Kalbskopf, Karl-Heinz, to FMC Corporation. Turboventilator for the input of oxygen into liquids. 3,704,009, Cl. 261-91.000.

Kalish, Arthur. Self-adjusting sewing machine gage. 3,703,873, Cl. 112-153.000.

Kalium Chemicals Limited: *See—*
Kelly, Clifford J., 3,704,101.

Kalkhof, Gustav: *See—*
Pfeuffer, Alfred; Kalkhof, Gustav; and Weber, Helmut, 3,704,012.

Kallianos, Andrew G.: *See—*
Norman, Vello; Williams, Thomas B.; Kallianos, Andrew G.; and Mold, James D., 3,703,901.

Kaltenbronn, James S.; and Short, Franklin W. 4-and 5-aryl-1-naphthaleneethanol compounds. 3,704,328, Cl. 260-618.00f.

Kaneko, Masanao: *See—*
Kishida, Yukichi; Soma, Nobuo; Nakazawa, Junichi; Sato, Yoshio; Matsuda, Hidebumi; Terada, Atsusuke; Watanabe, Taiichiro; Sugimura, Yukio; Miyamura, Toshihide; Kaneko, Masanao; and Watatani, Mitsuo, 3,704,294.

Kanter, Jerome J., to Crane Co. Process for enameling ferrous articles. 3,704,153, Cl. 117-23.000.

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Karlson, Eskil L.: *See—*
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Karstensen, Karl W.; and Kizer, Richard W., to Caterpillar Tractor Co. Combined turbine nozzle and bearing frame. 3,704,075, Cl. 415-68.000.

Kato, Masaaki; and Sato, Shigeta, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrodialysis method using ion exchange membranes. 3,704,218, Cl. 204-180.00p.

Kato, Tetsuya: *See—*
Yamashita, Takashi; Chida, Yugo; Ninagawa, Sadayoshi; and Kato, Tetsuya, 3,704,317.

Katsuragi, Mamoru, to Minolta Camera Kabushiki Kaisha. Daylight film developing tank. 3,703,859, Cl. 95-90.500.

Kauf, Walter. Wire stripper. 3,703,840, Cl. 81-9.50r.

Kaufman, Jack W. Implements (ill). 3,704,072, Cl. 401-291.000.

Kaufman, Theodore Phillip, to Control Technology, Inc. Ambient light variation detector. 3,704,374, Cl. 250-206.000.

Kaufmann, Otto: *See—*
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Kaule, Gustav: *See—*
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Kawaguchi, Hideo: *See—*
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Kawasaki Steel Corporation: *See—*
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Keene, Robert F. Quick adjusting C-clamp. 3,704,014, Cl. 269-249.000.

Kehr, Clifton Leroy: *See—*
Ketley, Arthur Donald; Kehr, Clifton Leroy; and Touchette, Jennie Lee, 3,704,125.

Kelly, Clifford J., to Kalium Chemicals Limited. Method for operating multiple effect evaporator. 3,704,101, Cl. 23-296.000.

Kelly Systems, Inc.: *See—*
Kelly, William F., 3,703,748.

Kelly, William F., to Kelly Systems, Inc. Anchor frr post-tensioning prestressed concrete. 3,703,748, Cl. 24-126.000.

Kelsey-Hayes Company: *See—*
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Kempa, Joseph E.: *See—*
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Kendall Company, The: *See—*
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Kenics Corporation: *See—*
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Kennedy, Kenneth F. Marine sewage collection and discharge systems. 3,703,960, Cl. 210-121.000.

Ketley, Arthur Donald; Kehr, Clifton Leroy; and Touchette, Jennie Lee, to Grace, W. R., & Co. Color process. 3,704,125, Cl. 96-14.000.

Kikuchi, Shoji: *See—*
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Kindy, Ronald J.: *See—*
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King, George. Explosive charge device and assembly. 3,703,780, Cl. 42-1.00r.

King, Gordon E.: *See—*
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King, Josef: *See—*
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Kinstley, Warren O.; and Sivertsen, David R., to Texas Instruments, Incorporated. Method of depositing a metal oxide film by electron bombardment. 3,704,216, Cl. 204-164.000.

Kiser, Warren C., to Shovel Supply Co., Inc. Control apparatus. 3,703,836, Cl. 74-471.00r.

Kishida, Yukichi; Soma, Nobuo; Nakazawa, Junichi; Sato, Yoshio; Matsuda, Hidebumi; Terada, Atsusuke; Watanabe, Taiichiro; Sugimura, Yukio; Miyamura, Toshihide; Kaneko, Masanao; and Watatani, Mitsuo; deceased (by Watatani, Takako; heiress), to Sankyo Compan Limited. Process for preparing 6-aminopenicillanic acid compounds. 3,704,294, Cl. 260-239.100.

Kishimoto, Shoji: *See—*
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Knapp, Heinrich: *See—*
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Knapp, Robert S., to Hoover Company, The. Steam-dry iron. 3,703,777, Cl. 38-77.830.

Knitting Specialty Machinery Corporation, mesne: *See—*
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Kobayashi, Keisuke: *See—*
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Koda, Ken'Ichi; Kikuchi, Shoji; Wada, Tsuneo; Kuwabara, Yoshimi; Horikoshi, Akira; Tanimura, Kensaku; and Sugita, Sadao, to Konishiroku Photo Industry Co., Ltd. N-Ylide compounds as antistatic agents in photography. 3,704,128, Cl. 96-50.000.

Kodama, Yutaka; Takai, Akira; and Inagaki, Tatsumi, to Toyama Chemical Co., Ltd. Method for promoting the growth of livestock. 3,704,335, Cl. 424-249.000.

Koens, Gilliaan Peter: *See—*
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Kohashi, Tadao: *See—*
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Kohda, Akihide; Kohno, Shigeharu; Takahashi, Tohru; and Sugimoto, Hachiro, to Eisai Co., Ltd. N-Lower alkyl-substituted n'-[β-(2',5'-dephenylpyrrolyl-1')] ethylhomopiperazines. 3,704,244, Cl. 260-326.900.

Kohler, Heinz-Werner, to Mobus, Karl, KG Zeichnungs-Ordner. Cabinet for the hanging storage of drawings, plans or the like. 3,704,051, Cl. 312-184.000.

Kohler, Robert: *See—*
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Kohlhaupt, Reinhold: *See—*
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Kohno, Shigeharu: *See—*
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Kolbeck, Winfried: *See—*
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Kolby, Mark J.; and Goldbach, Henry T., to Bio-Medical Sciences, Inc. Quality control system. 3,704,362, Cl. 235-151.130.

Komor, Joseph A., to GAF Corporation. Surfactant for electrolyte-containing processing solutions. 3,704,262, Cl. 252-353.000.

Koncos, Robert: *See—*
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Kondur, Nicholas, Jr.: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Korb, Lawrence J.; and Soja, Joseph. Outdoor lighted artificial Christmas tree. 3,704,366, Cl. 240-10.00t.

Korb, Lawrence J. Lighted Christmas star display. 3,704,367, Cl. 240-10.00s.

Kosche, Horst. Method of multiple transfer of latent electrostatic images. 3,704,120, Cl. 96-1.00r.

Koshar, Robert J., to Minnesota Mining and Manufacturing Company. Functional bis (perfluoroalkylsulfonyl) alkyl compounds. 3,704,311, Cl. 260-486.00h.

Kotheimer, William C.: *See—*
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Kott, Alan C.; Jankowiak, Erwin M.; and Lane, George A., to Dow Chemical Company, The. Pyrotechnic disseminating composition. 3,704,187, Cl. 149-60.000.

Kracauer, Paul. Popcorn product. 3,704,133, Cl. 99-83.000.

Kraft, Lewis E. Machine tool spindle and drive. 3,703,846, Cl. 90-11.000.

Kraft, Michael J.: *See—*
Swanson, Kenneth W.; Rolland, William C.; and Kraft, Michael J., 3,703,957.
Swanson, Kenneth W.; Rolland, William C.; and Kraft, Michael J., 3,703,958.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Indane derivatives. 3,704,323, Cl. 260-576.000.

Krimmel, Carl Peter, to Searle, G. D., & Co. Adamantane-1,3-dicarboxylic acid esters. 3,704,306, Cl. 260-268.0pa.

Kroeger, Paul T. Paint can agitator and pouring top. 3,704,007, Cl. 259-122.000.

Krohn, Richard H.: *See—*
Rose, Edward A.; Krohn, Richard H.; and Slater, Donald E., 3,704,461.

Kuehl, Donald K.; Blackman, Arthur W.; and Glassman, Irvin, to United Aircraft Corporation. Isopycnic slurry formulations. 3,704,184, Cl. 149-1.000.

Kuhle, Engelbert: *See—*
Zecher, Wilfried; Kuhle, Engelbert; and Holtschmidt, Hans, 3,704,307.

Kuhn, Kenneth G.; and Chamberlain, Neal C., to FMC Corporation. Self metering feeder conveyor. 3,703,952, Cl. 198-102.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Inoue, Kiyoshi; Ishikawa, Tetsuo; and Okada, Shingo, 3,703,796.

Kurtz, Abraham J.: *See—*
Smith, Avery B.; Hennig, Ralph R.; Kurtz, Abraham J.; and Pantchenko, Gregory, 3,704,098.

Kusel, Edward J., to Questor Corporation. Tubular spindle having deformable flattened ends. 3,704,005, Cl. 256-22.000.

Kushmuk, Walter P.: *See—*
Hutchinson, William Y.; and Kushmuk, Walter P., 3,703,935.

Kusovsky, Boris Isaakovich; Pavlov, Nikolai Ivanovich; Matiichenko, Anatoly Petrovich; Zakharov, Sergei Alexandrovich; and Birjukov, Dmitry Anatolievich, to Ryazansky Filial Spetsialnogo Konstruktorskogo Bjuro Ann. Device for automatic control of the proces of crude petroleum desalting and dehydration in electric dehydrators. 3,704,222, Cl. 204-306.000.

Kussy, Frank W.; and Heberlein, Gustave E., Jr., to I-T-E Imperial Corporation. Tripping system for circuit breaker. 3,704,435, Cl. 335-255.000.

Kusters, Eduard, Maschinenfrik: *See—*
Appenzeller, Valentin, 3,703,862.

Kuwabara, Yoshimi: *See—*
Koda, Ken'Ichi; Kikuchi, Shoji; Wada, Tsuneo; Kuwabara, Yoshimi; Horikoshi, Akira; Tanimura, Kensaku; and Sugita, Sadao, 3,704,128.

La Canfora, Peter S., to Gyrex Corporation, mesne. Apparatus for preparing master reticles. 3,703,858, Cl. 95-12.000.

La Via, Anthony Laurence; O'Laughlin, Richard Lawrence; and Walton, Richard Wiegmann, to Squibb, E. R., & Sons, Inc. Low-calorie sweetening composition and method of producing the same. 3,704,138, Cl. 99-141.00a.

Lackey, Marion D.: *See—*
Davis, Leo W.; Lackey, Marion D.; Ross, John Reuben; and Trenary, Bryant, 3,704,040.

Lagofun, Guy Jean Theodore, to Etat Francais represents par le Ministre charge de la Defense Nationale Delegation Ministerielle pour l' Armement. Arc igniter circuit closing device and methods of operation thereof. 3,704,354, Cl. 200-144.00r.

Laing, Nikolaus. Storage panels, particularly for heated floors. 3,704,359, Cl. 219-213.000.

Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., to Polaroid Corporation. Silver image stabilization with noble metal compounds. 3,704,126, Cl. 96-29.00r.

Landi, Henry Patrick, to American Cyanamid Company. Catalytic membrane air electrodes for fuel cell and fuel cells containing same. 3,704,171, Cl. 136-86.00a.

Landis, Donald E.; Sidhu, Mohanjit S.; and Cone, Richard E., to National Cash Register Company, The. Rotary drum coin stacking and dispensing device. 3,703,903, Cl. 133-1.000.

Landrum, Ira T., to Internal Pipeline Services, Inc. Internal pipeline coating apparatus. 3,703,947, Cl. 188-290.000.

Landwier, William G., to Maytag Company, The. Dishwasher condenser system. 3,704,170, Cl. 134-25.00a.

Lane, George A.: *See—*
Kott, Alan C.; Jankowiak, Erwin M.; and Lane, George A., 3,704,187.

Lanham, Richard R. Digital read out indicator for vehicles. 3,704,445, Cl. 340-62.000.

Lannert, Kent P., to Monsanto Company. Detergent formulations. 3,704,320, Cl. 252-546.000.

Laudadio, Sanfrancisco Cayetano Roque. Suspension system for motor vehicles. 3,704,027, Cl. 280-87.00b.

Lavarda, John. Preparation of ricotta cheese curd. 3,704,136, Cl. 99-116.000.

Laverty, Richard C., to MSL Industries, Inc. Fastener with improved thread construction. 3,703,843, Cl. 85-46.000.

Leeds & Northrup Company: *See—*
Cohn, Nathan, 3,704,380.

Lehovec, Kurt; and Seeley, William G., to Inventors & Investors, Inc. Photo-electric junction field-effect sensors. 3,704,376, Cl. 250-211.00j.

Lehovec, Kurt, to Inventors and Investors, Inc. Laser comprising Fresnel optics. 3,704,377, Cl. 331-94.50d.

Leiser, Florence E. Portable urinal. 3,703,731, Cl. 4-110.000.

Leitgeb, Wilhelm, to Siemens Aktiengesellschaft. Speed controlled synchronous inverter motor. 3,704,402, Cl. 318-166.000.

Lemgo-Lippe, Kurt Hesse, to Staff & Schwarz G.m.b.H. Current distributor rail. 3,704,437, Cl. 339-21.00r.

Lemieux, Thomas H., to United States of America, Navy. Flexible hose wire payout system. 3,703,874, Cl. 114-21.00r.

Lepold, Manfred F.; Heinze, Gerhard; Kaule, Gustav; and Podschus, Ernst, to Bayer Aktiengesellschaft. Adsorption process for the complete and nondissipative separation of a gas mixture into adsorbable and non-adsorbable, in particular radioactive component. 3,703,797, Cl. 55-62.000.

Leugering, Hans-Joachim: *See—*
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Lever Brothers Company: *See—*
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Levolor Lorentren, Inc.: *See—*
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Lewis, Frederick M.: *See—*
Berger, Abe; and Lewis, Frederick M., 3,704,261.

Libbey-Owens-Ford Company: *See—*
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Lichtenvort, Uwe; Kluge, Johannes; and Schleyer, Meinolf, to Demag AG. Hanging type switch construction. 3,704,355, Cl. 200-157.000.

Liggett & Myers Incorporated: *See—*
Norman, Vello; Williams, Thomas B.; Kallianos, Andrew G.; and Mold, James D., 3,703,901.

Limbough, Pol Jean, to U.S. Philips Corporation, mesne. Method of manufacturing miniaturized electric circuits. 3,704,163, Cl. 117-212.000.

Lind, Willard M., to FMC Corporation. Method of aligning forms. 3,703,762, Cl. 29-464.000.

Lindsey, James M.; and Stell, Thomas W., to Sperry-Sun Well Surveying Company. Rotor tilt. 3,703,832, Cl. 74-5.450.

Lindsey, James M., to Sperry Sun Well Surveying Company. Gyro servo control system and structure. 3,704,407, Cl. 318-648.000.

Lindstrom, Olie B. Pyrolysis of hydrocarbons. 3,704,332, Cl. 260-679.00r.

Linn, Wallace L.; and Voland, Elmo W., to Mallory, P. R., & Co., Inc. Timer with sandwiched internal escapement mechanism disposed between two programming means. 3,704,351, Cl. 200-38.00r.

Linnenbecker, Udo: *See—*
Renner, Eskhard; and Linnenbecker, Udo, 3,703,849.

Linton, Richard H.: *See—*
Simone, Roy R. De; and Linton, Richard H., 3,704,384.

Lipscomb, Walter P.: *See—*
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Loboda, Jon A.: *See—*
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Lockwood, Don L.: *See—*
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Loctite Corporation: *See—*
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Lodge, Malcolm A.: *See—*
Parker, Robert E.; Lodge, Malcolm A.; and Jewell, George S., 3,704,372.

Lofftus, Leroy A.: *See—*
Forys, Edward Louis; Lofftus, Leroy A.; Malueg, Richard Milton; and Montalbano, Albert F., 3,703,999.

Lofstrand, Wilton S.; and Montgomery, John G., said Lofstrand assor. to FMC Corporation. Automatic sprinkling system. 3,703,930, Cl. 169-2.00r.

Longensiepen, Max, Kom, Ges.: *See—*
Mattes, Heinz Otto; and Flesch, Friedrich, 3,703,790.

Loricchio, Domingos, to Carborundum Company, The. Exothermic compositions. 3,704,230, Cl. 252-182.000.

Loveland, Malcolm W.; and Singleton, Robert J., to Atlas Pacific Engineering Company. Apparatus for feeding conveyor from bulk supply. 3,704,041, Cl. 302-14.000.

Lucas, Joseph, (Industries) Limited: *See—*
Coffin, George, 3,704,418.

Ludsteck, Dieter: *See—*
Bayew, Dimiter; Daeuble, Manfred; Kaufmann, Otto; Ludsteck, Dieter; Pfitzner, Helmut; and Witsch, Heinz-Guenter, 3,704,086.

Luerken, Joseph: *See—*
Ty, Henry; and Luerken, Joseph, 3,704,179.

Lundstrom, John W., to Moisture Register Company. Scanning impedance measuring system employing a spiral sensing element. 3,704,412, Cl. 324-61.00r.

Mac Carr, Lottie. Elevated and confined floor area apparatus for the care of invalids and small children. 3,703,734, Cl. 5-99.00r.

MacDonald, John L., to Cincinnati Incorporated. Safety device for machines. 3,704,396, Cl. 317-124.000.

MacDuff, Richard, to Hercules Incorporated. Trimming flash with ultrasonic tool. 3,704,188, Cl. 156-73.000.

Mack, Robert J.; and Fischer, John L., to Kendall Company, The. Hydrophobic non-adherent wound dressing. 3,703,897, Cl. 128-156.000.

Mack, Ronald H.; Wilczewski, Robert H.; and Kondur, Nicholas, Jr., to Burroughs Corporation. Reciprocally engageable clutch mechanism. 3,703,948, Cl. 192-33.00r.

MacKinney, John J., to Budd Company, The. Electroforming jointless metal belt. 3,704,175, Cl. 204-9.000.

MacKinnon, Alan G., to Brode, W. M., Company, The. Highway slotting device. 3,703,857, Cl. 94-45.00r.

MacLeod, Kenneth H.: *See—*
Sullivan, Paul G.; MacLeod, Kenneth H.; and Kempa, Joseph E., 3,703,995.

Maddalena, Edward J.: *See—*
Maddalena, Richard E.; and Maddalena, Edward J., 3,703,884.

Maddalena, Richard E.; and Maddalena, Edward J. Automated dairy barn milk stall. 3,703,884, Cl. 119-27.000.

Mader, Rudolf Mayer; and Schwinum, Ernst, to Bayer Aktiengesellschaft. Process for the production of sulphur-modified polychloroprenes with improved storage life. 3,704,283, Cl. 260-79.000.

Madlener, Paul; and Pecksen, Otto, to Industrie-Werke Karlsruhe Aktiengesellschaft. Mine detonator with electric ignition. 3,703,867, Cl. 102-70.20r.

Madrid, Robert W.: *See—*
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Maeda, Hisao; deceased (Maeda, Hisaaki; heir); and Kobayashi, Keisuke, to Toko Kabushiki Kaisha. Driving technique for thin film memory elements. 3,704,457, Cl. 340-174.0pw.

Maeda, Shigeyoshi: *See—*
Nishihara, Toshiro; Asano, Hidejiro; Maeda, Shigeyoshi; and Oyagi, Yashichi, 3,704,181.

Maehr, Richard J.: *See—*
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Maeno, Shizuo: *See—*
Umio, Suminori; Ueda, Ikuo; Sato, Yoshinari; and Maeno, Shizuo, 3,704,245.

Maeshiba, Sozaburo. Direct-reading gasoline meter with bob and float control of measuring tape. 3,703,830, Cl. 73-321.000.

Magerlein, Barney J., to Upjohn Company, The. Intermediates for making lincomycins and process for preparing the same. 3,704,289, Cl. 260-210.00r.

Magnacheck Corporation: *See—*
Bradford, John Ramsey, 3,703,864.

Magne, Frank C.: *See—*
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,704,257.

Makino, Katsuo; Yamada, Yoshihiko; and Onozaki, Jun, to Fuji Photo Film Co., Ltd. Electrophotographic reproduction process using a dual layered photoreceptor. 3,704,121, Cl. 96-1.000.

Makino, Katsuo; and Sawato, Iwao, to Fuji Photo Film Co., Ltd. Dye sensitized photoconductive material. 3,704,123, Cl. 96-1.600.

Malesci S.A.S. Istituto Farmacobiologico: *See—*
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Mallory, P. R., & Co., Inc.: *See—*
Griffiths, Leonard B.; and Shen, Yuan-Shou, 3,704,182.
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Mankofsky, Ben: *See—*
Mann, Sam; and Mankofsky, Ben, 3,703,740.

Mann, Sam; and Mankofsky, Ben, said Mann assor. to said Mankofsky, Ben. Drapery carrier device. 3,703,740, Cl. 16-87.200.

Manuel, James C.: *See—*
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Marathon Oil Company: *See—*
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Marshall, Harry L.: *See—*
Frey, James O.; Marshall, Harry L.; and Minnier, Henry B., 3,704,232.

Martin, Hans. Brake mechanism attached to a ski. 3,704,024, Cl. 280-11.13b.

Maruyama, Syunsuke: *See—*
Ueoka, Hisayoshi; Horii, Kazuo; Umeya, Kazumasa; and Maruyama, Syunsuke, 3,704,266.

Mas, Fred L.: *See—*
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Masak, Raymond J.; and Baurle, Herbert F., to Hazeltine Corporation. Angular position determining system compensated for doppler. 3,704,465, Cl. 343-102.000.

Masseran, Jean, to Micro-Mega. Dental instrument for root canal work. 3,703,767, Cl. 32-40.000.

Mastic Corporation: *See—*
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Materials and Methods Limited: *See—*
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Matiichenko, Anatoly Petrovich: *See—*
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Matsumoto, Nobuo: *See—*
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Matsushita Electric Industrial Company, Limited: *See—*
Nakamura, Shigeaki; Nakamura, Tadao; and Kohashi, Tadao, 3,704,265.

Mattes, Heinz Otto; and Flesch, Friedrich, to Longensiepen, Max, Kom. Ges. Accessory for adhesively fixing and bonding fastening elements in fixing holes. 3,703,790, Cl. 52-98.000.

Mattes, Lee H., to Mastic Corporation. Building siding units. 3,703,795, Cl. 52-521.000.

Maulding, Donald Roy, to American Cyanamid Company. Method of preparation of substituted diaryl oxalates. 3,704,309, Cl. 260-479.00s.

Maxwell, Edward Ralph. Portable tree stand. 3,703,939, Cl. 182-107.000.

Mayadas, Ashok F.: *See—*
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Maytag Company, The: *See—*
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Mc Coy, Michael R.; and Walther, Terry R., to Electronic Arrays, Inc. Accession system for and in integrated circuit type memories. 3,704,454, Cl. 340-173.0sp.

Mc Fadden, Bruce R. Card reader. 3,704,360, Cl. 235-61.11.

McCaulay, James L.: *See—*
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McCaully, Ronald J.: *See—*
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McClelland, Donald H.; Pankow, Herbert G.; and Wolcott, Edward O Terminal seal electrochemical device. 3,704,173, Cl. 136-135.00r.

McClelland, Walter B., to Teletype Corporation. Method and apparatus for memory and display. 3,704,389, Cl. 315-84.500.

McClincy, Richard J.: *See—*
Wilson, Benjamin John; McClincy, Richard J.; and Downing, James Herbert, 3,704,114.

McClincy, Richard Joseph; Downing, James Herbert; and Wilson, Benjamin Jrhn, to Union Carbide Corporation. Process for the production of elemental silicon. 3,704,094, Cl. 423-350.000.

McClinton, John. Safety pack-off for wells. 3,703,904, Cl. 137-504.000.

McClure, James N. Mobile variable head, hedge trimmer. 3,703,803, Cl. 56-237.000.

McConnell, Lorne D., to I-T-E Imperial Corporation. Cryogenic current limiting switch. 3,704,391, Cl. 317-11.00c.

McCully, Charles R.: *See—*
McCully, Charles Roland; and McCully, Charles R., 3,704,221.

McCully, Charles Roland (McCully, Roland A.; Executor of); and McCully, Charles R.; deceased. Medium for ionic transport. 3,704,221, Cl. 204-295.000.

McCully, Roland A.: *See—*
McCully, Charles Roland; and McCully, Charles R., 3,704,221.

McDonald, John William, to Du Pont de Nemours, E. I., and Company. Coated article and method of making same. 3,704,157, Cl. 117-68.500.

McDowell Electronics, Inc.: *See—*
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McDowell, Robert Bruce, to McDowell Electronics, Inc. Impedance matching network for use with sputtering apparatus. 3,704,219, Cl. 204-192.000.

McFern, Paul E. Protector screen for tractor drivers. 3,704,030, Cl. 280-150.00r.

McHugh, James D., to General Electric Company. Spiral groove face seals. 3,704,019, Cl. 277-27.000.

McHugh, John Francis: *See—*
Holovka, Charles, Jr.; Demchyshyn, Bohdan; and McHugh, John Francis, 3,704,015.

McHugh, Neil Martin; Scheurman, Clarence, III; and Schulerud, Albert Lyle, to Colgate-Palmolive Company. Drying of detergents. 3,703,772, Cl. 34-9.000.

McIlvenna, John F., Jr.: *See—*
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McIntosh, Alexander Charles; and Smith, Maurice Irvin, to Tel-Tone Corporation. Service observing system. 3,704,348, Cl. 179-175.20c.

McLain, John H.; and Porter, Bobby J., to Brown Engineering Company, Inc., mesne. Solder leveling method. 3,704,165, Cl. 117-212.000.

McLoughlin, George. Bath arrangements. 3,703,733, Cl. 4-185.100.

McNaney, Joseph T. Electrically controllable light conducting device. 3,704,060, Cl. 350-160.00r.

Mead Johnson & Company: *See—*
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Merck & Co., Inc.: *See—*
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Merges, John C., Jr.: *See—*
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Merlo, Angelo Louis. Combustion microwave diagnostic system. 3,703,825, Cl. 73-116.000.

Merriman, Inc.: *See—*
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Merryweather, Lloyd. Sprinkler head protector. 3,703,992, Cl. 239-201.000.

Messer Griesheim GmbH: *See—*
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Preinfalk, Franz; and Meuters, Gunther, 3,703,943.

Meyers, Edward F. Disposable, retractable thermometer jacket. 3,703,892, Cl. 128-2.00h.

Meyers, Elwood J.; and Falk, Earl J., to Barber-Colman Company. Thrust controller for propulsion systems with commonly driven, controllable pitch propellers. 3,704,077, Cl. 416-30.00r.

Mhatre, Nagesh Shamrao: *See—*
Freake, Ronald; Gunter, Claude Ray; Haden, Billy Harper; and Mhatre, Nagesh Shamrao, 3,704,206.

Michelsen, Finn C. Towed underwater apparatus. 3,703,876, Cl. 114-235.00b.

Micro-Mega: *See—*
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Micromedic Systems, Inc.: *See—*
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Miles Laboratories, Inc.: *See—*
Freake, Ronald; Gunter, Claude Ray; Haden, Billy Harper; and Mhatre, Nagesh Shamrao, 3,704,206.

Milgram, Alvin A., to Du Pont de Nemours, E. I., and Company. Process of producing conductive gold patterns. 3,704,162, Cl. 117-212.000.

Miller, Earl A. Artificial lighted icicle. 3,704,365, Cl. 240-10.00r.

Miller, Earl D., Jr.; and Kindy, Ronald J., to Eagle-Picher Industries, Inc. Positioning device. 3,704,405, Cl. 318-467.000.

Miller, Robert N., to International Computer Products, Inc. Dual motor control. 3,704,401, Cl. 318-7.000.

Miller, Samuel E., to Quick Service Textiles, Inc. Interlining. 3,703,730, Cl. 2-272.000.

Mills, Richard M., to Puett Electrical Starting Gate, Inc. Retractable automatic breaking door for starting gates. 3,703,883, Cl. 119-15.500.

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Minolta Camera Kabushiki Kaisha: *See—*
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Mintech Corporation: *See—*
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Mitsubishi Petrochemical Company Limited: *See—*
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Miyamura, Toshihide: *See—*
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Mobus, Karl, KG Zeichnungs-Ordner: *See—*
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Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., to United States of America, Agriculture. N-Cyclohexyl-N-(2-cyanoethyl) oleamide as a plasticizer. 3,704,257, Cl. 260-404.500.

Modestov, Boris Sergeevich: *See—*
Bodunov, Igor Vasilievich; Modestov, Boris Sergeevich; and Ivanchenko, Viktor Vasilievich, 3,704,076.

Moisture Register Company: *See—*
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Mousseron, Max J., to Etablissements Clin-Byla. Substituted thiazolidine-4-ones. 3,704,296, Cl. 260-240.00a.
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Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Pencil having a formed ABS polymer barrel. 3,704,071, Cl. 401-96.000.
Munakata, Katsura. Method for synthesizing fish-killing substances and fish killers. 3,704,247, Cl. 260-340.500.
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Nercessian, Sarkis, to Forbro Design Corporation. High stability regulator controlling high current source with lesser stability. 3,704,381, Cl. 307-53.000.
Nerenberg, Samuel T. Segmental macromolecular separation method and apparatus. 3,704,217, Cl. 204-180.00g.
Neuworth, Martin B., to Continental Oil Company. Alkylidenedithiobisphenols. 3,704,327, Cl. 260-609.00f.
Nevitt, Milton, to Spray Shine Incorporated. Aerosol spray polish. 3,704,143, Cl. 106-5.000.
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Nickell, Louis G., to Hawaiian Sugar Planters Association. Ripening of sugarcane by use of alkyl derivatives of 3-phenoxy pyridazine. 3,704,111, Cl. 71-92.000.
Nicklin, Thomas, to Gas council, The. Treatment of gases. 3,704,095, Cl. 423-242.000.
Nigro, Louis V., to Gillette Company, The. Adjustable spray rate actuator. 3,703,994, Cl. 239-397.000.
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Osborne, Denis A. N.; Haines, Robert C.; and Kilshaw, John A., to Dunlop Company Limited, The. Apparatus for comparing moments of inertia of golf clubs. 3,703,824, Cl. 73-65.000.
Osborne, Thomas E., to Hewlett-Packard Company. Data processing control system. 3,704,448, Cl. 340-172.500.
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Paidosh, Richard L., to Minnesota Mining and Manufacturing Company. X-ray film cassette. 3,704,369, Cl. 250-65.00r.
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Patrie, Jos, to Cegedur GP. Process for coloring aluminum objects. 3,704,210, Cl. 204-35.00n.
Patry, Leon R., to Adjusta-Post Manufacturing Company. Mounting device for a light fixture globe. 3,704,368, Cl. 240-128.000.
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Soehngen, John William; Wagner, William Sherwood; Jamison, Saunders Eliot; and Canfield, Dale Kelley. Process of making tobacco smoke filters from extruded polymer and binder. 3,704,192, Cl. 156-167.000.

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Stehlik, Gerhard, to Osterreichische Studiengesellschaft fur Atomenergie G.m.b.H. Process for the sterilization of medicinal tissue-binding substances. 3,704,089, Cl. 21-54.00r.
Stein, Reinhardt P.; and Smith, Herchel, to American Home Products Corporation. 13-Polycarbonalkyl-16-methylgona-1,3,5(10)-trienes and 13-polycarbonalkyl-16-methylgon-4-en-3-ones and intermediates for their production. 3,704,253, Cl. 260-397.400.
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Swanson, Kenneth W.; Rolland, William C.; and Kraft, Michael J. Pneumatic separator, filter and particle conveying system. 3,703,958, Cl. 209-144.000.
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Walter, Vincent J. Running lights and differential parking systems for vehicles. 3,704,446, Cl. 340-74.000.

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Mc Coy, Michael R.; and Walther, Terry R., 3,704,454.

Walton, Richard Wiegmann: *See—*
La Via, Anthony Laurence; O'Laughlin, Richard Lawrence; and Walton, Richard Wiegmann, 3,704,138.

Walton, Roger H., to United States of America, Air Force. Coupler-cargo pallet/container. 3,703,870, Cl. 105-366.00r.

Waly, Adnan, to Personal Communications, Inc. Micro-image recording and read-out system. 3,704,068, Cl. 355-46.000.

Wampler, David M., to Libbey-Owens-Ford Company. Spray coating apparatus. 3,703,880, Cl. 118-2.000.

Ware, Richard E.; and Merges, John C., Jr., to Sun Oil Company of Pennsylvania, mesne. Investment casting wax. 3,704,145, Cl. 106-38.700.

Warner-Lambert Company: *See—*
Strandtmann, Maximilian Von; Cohen, Marvin P.; and Shavel, John, Jr., 3,704,234.
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., 3,704,298.

Wasaburo, Ohta; and Nobouri, Murayama, to Ricoh Co., Ltd. Electronic graphic recording system. 3,704,468, Cl. 346-74.0cr.

Washecheck, Paul H.; and Starks, Charles M., to Continental Oil Company. Production of carboxylic acids. 3,704,319, Cl. 260-540.000.

Wastenson, Erik Goran; and Bockstiegel, Georg Heinrich Artur Gerhard, to Hoganas AB. High alloy steel powders and their consolidation into homogeneous tool steel. 3,704,115, Cl. 75-.5bc.

Watanabe, Taiichiro: *See—*
Kishida, Yukichi; Soma, Nobuo; Nakazawa, Junichi; Sato, Yoshio; Matsuda, Hidebumi; Terada, Atsusuke; Watanabe, Taiichiro; Sugimura, Yukio; Miyamura, Toshihide; Kaneko, Masanao; and Watatani, Mitsuo, 3,704,294.

Watarai, Syu: *See—*
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Watatani, Takako: *See—*
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Wayson, Andrew J.; and O'Connell, John T., to Merriman, Inc. Continuous method of forming two-part travelers. 3,703,759, Cl. 29-417.000.

Weathers, Robert E. Thermo cold-pak container. 3,703,816, Cl. 62-457.000.

Weber, Abraham; and Frossard, Jacques J., to Mead Johnson & Company. Octalone carboxylic acid anhydrides. 3,704,250, Cl. 260-346.350.

Weber, Helmut: *See—*
Pfeuffer, Alfred; Kalkhof, Gustav; and Weber, Helmut, 3,704,012.

Weber Marking Systems, Inc.: *See—*
Anderson, Bror E.; and Schick, Margery L., 3,704,155.

Wei, Peter H. L.; and Bell, Stanley C., to American Home Products Corporation. Certain thiazole [3,2-a] benzimidazole compound. 3,704,239, Cl. 260-306.700.

Wei, Peter H. L.; and McCaully, Ronald J., to American Home Products Corporation. 3-Substituted-4-hydroxy-2-substituted imino-4-phenyl-5-thiazolidine alkyl carboxylic acids and their alkyl esters. 3,704,240, Cl. 260-306.700.

Wei, Peter H. L., to American Home Products Corporation. 6,7,8,9-Tetra hydropyrimido (2,1-b)-benz othiozole-6-carboxylic acid, alkyl esters. 3,704,303, Cl. 260-250.50r.

Wei, Peter H. L.; and Bell, Stanley C., to American Home Products Corporation. 5 (7)-Acetamid 0-3-(substituted phenyl)-2,3-dihydro-3-hydroxy-7 alpha) pyrimidine-2-alkanoic acid, alkyl esters. 3,704,304, Cl. 260-250.50r.

Weigel, Charles P., to Timken Company, The. Method of forming a bearing by melting, working and heat treatment. 3,704,183, Cl. 148-126.000.

Weigel, Robert M.: *See—*
Coyer, Robert D.; and Weigel, Robert M., 3,704,466.

Weigel, Virginia: *See—*
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Weiss, Donald C.: *See—*
Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L., 3,704,364.

Welch, Donald C., to Trane Company, The. Double fin cooling coil with condensate director. 3,703,815, Cl. 62-290.000.

Welter, Clarence J., to Diamond Laboratories, Inc. Transmissible gastroenteritis vaccines and methods of producing the same. 3,704,203, Cl. 195-1.300.

Wemmers, Anton: *See—*
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Wertz, William H.: *See—*
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Westerman, George Raymond, to Bell Telephone Laboratories, Incorporated. Starting circuit for low voltage inverters utilizing regenerative action in the feedback transformer of the inverter to generated starting signals. 3,704,430, Cl. 331-113.00a.

Western Electric Company, Incorporated: *See—*
Steele, Terri Giversen, 3,704,186.

Western Geophysical Company of America: *See—*
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Westphal, Klaus, to Telefunken Patentyerwertungsgesellschaft m.b.H. Article for use in sound recording and reproducing instruments. 3,703,837, Cl. 74-519.000.

Weyerhaeuser Company: *See—*
Freeman, Harlan G.; and Gillern, Maurice F., 3,704,269.

Whisler, Howard E.; Shah, Bhupendra Umedchand; Jeskey, Gerald Vernon; and Bloom, Ray Albert, to Timken Roller Bearing Company, The. Apparatus for introducing molten metal into a strand casting mold. 3,703,924, Cl. 164-337.000.

Whitehouse, Maynard L.: *See—*
Strobel, Albert F.; and Whitehouse, Maynard L., 3,704,293.

Wiberg, Edwin E. Heating apparatus. 3,703,895, Cl. 126-85.00b.

Wigal, Voorhis F. Multiple jumping device. 3,703,784, Cl. 46-129.000.

Wikel, David C.; and Smith, Rymer H., to Wikel Manufacturing Co., Inc. Seal coating machine. 3,703,856, Cl. 94-44.000.

Wikel Manufacturing Co., Inc.: *See—*
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Wilczewski, Robert H.: *See—*
Mack, Ronald H.; Wilczewski, Robert H.; and Kondur, Nicholas, Jr., 3,703,948.

Wilkinson, Peter R. S. Apparatus for photographic processing. 3,703,860, Cl. 95-93.000.

Willems, Jozef Frans: *See—*
Pollet, Robert Joseph; Philippaerts, Herman Adelbert; Willems, Jozef Frans; and Claes, Frans Henri, 3,704,130.

Williams, Thomas B.: *See—*
Norman, Vello; Williams, Thomas B.; Kallianos, Andrew G.; and Mold, James D., 3,703,901.

Williamson, William A., to Clark Equipment Company. Control system for lift trucks. 3,703,806, Cl. 60-19.000.

Wilson, Benjamin John; McClincy, Richard J.; and Downing, James Herbert, to Union Carbide Crrporation. Process and furnace charge for use in the production of ferrosilicon alloys. 3,704,114, Cl. 75-3.000.

Wilson, Benjamin Jrhn: *See—*
McClincy, Richard Joseph; Downing, James Herbert; and Wilson, Benjamin Jrhn, 3,704,094.

Wilson, Calvin L., to Reynolds Metals Company. Cooking pan having article-supporting wall above bottom wall. 3,704,142, Cl. 99-446.000.

Wilson, Donald C., to FMC Corporation. Cooking and freezing products in flexible containers. 3,704,139, Cl. 99-192.00r.

Wilson, Geoffrey, to B. & S. Massey Limited. Upsetting or forging machines. 3,703,823, Cl. 72-406.000.

Windmoller & Holscher: *See—*
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Witsch, Heinz-Guenter: *See—*
Bayew, Dimiter; Daeuble, Manfred; Kaufmann, Otto; Ludsteck, Dieter; Pfitzner, Helmut; and Witsch, Heinz-Guenter, 3,704,086.

Wittemer, William C. Safety closure. 3,703,975, Cl. 215-9.000.

Witzky, Julius E. Pumpless stratified charge gas engine. 3,703,886, Cl. 123-32.0st.

Wolcott, Edward O.: *See—*
McClelland, Donald H.; Pankow, Herbert G.; and Wolcott, Edward O., 3,704,173.

Wolf, Milton; Diebold, James L.; and Bell, Stanley C., to American Home Products Corporation. Penicillins derived from the reaction of enamines with 6-isocyanato penicillanic acid. 3,704,291, Cl. 260-239.100.

Wolf-Dieter Klink: *See—*
Fiala, Ernst, 3,704,032.

Wolfe, Louis H.: *See—*
Spangler, Carl D., Jr.; Radd, Frederick J.; and Wolfe, Louis H., 3,704,333.

Wolfe, Milton; Diebold, James L.; Russell, Peter B.; and Bell, Stanley C., to American Home Products Corporation. Semicarbazidopenicillins. 3,704,292, Cl. 260-239.100.

Wolters, Ernst: *See—*
Burg, Karlheinz; Wolters, Ernst; Cherdron, Harald; and Leugering, Hans-Joachim, 3,704,275.

Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,704,314.

Womack, William Randol. View and cutter apparatus. 3,704,067, Cl. 355-29.000.

Woodruff, Edward T.; and Andersen, Viggo S., to Grace, W. R., & Co. Drying of sugar solutions. 3,704,169, Cl. 127-62.000.

Worthington Corporation: *See—*
Smith, Wilbur C., 3,703,811.

Wrestler, Edgar R.: *See—*
Wrestler, Frank; Swift, Harry J.; and Wrestler, Edgar R., 3,703,802.

Wrestler, Frank; Swift, Harry J.; and Wrestler, Edgar R. Combine apparatus. 3,703,802, Cl. 56-13.300.

Wright, Charles P., to Boeing Company, The. Height sensor for hydrofoil watercraft. 3,704,442, Cl. 340-1.00l.

Wright, Roy E.; and Vastag, Joseph. Adhesive for water-resistant corrugated paperboard bonds. 3,704,148, Cl. 106-79.000.

wSanders Associates, Inc.: *See—*
Johnson, Philip M.; Dudevoir, Wilfried G.; and Northrup, Richard M., 3,704,070.

Wynn, Michael J., to General Electric Company. Purification of dimethylhydrogenchlorosilane. 3,704,260, Cl. 260-448.20e.

Wynstra, John; and Gibb, Thomas B., Jr., to Union Carbide Corporation. Curable, solid polymers based on cycloaliphatic polyepoxides and a method for the preparation thereof. 3,704,268, Cl. 260-2.0ep.

Wysocki, Joseph J.; Adams, James E.; and Madrid, Robert W., to Xerox Corporation. Imaging system. 3,704,056, Cl. 350-150.000.

Xerox Corporation: *See—*
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Xomox Corporation: *See—*
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Yamaguchi, Nario; Shimizu, Sakae; and Tubuko, Kazuo, to Kabushiki Kaisha Ricoh. Electrophotographic plate comprising a photoconductor dispersed in a resin binder. 3,704,122, Cl. 96-1.800.

Yamaguchi, Tutomu: *See—*
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Yamaguchi, Yasuju; and Nakayama, Yujiro, to Mitsubishi Petrochemical Company Limited. Production of wood-plastics composite structures. 3,704,161, Cl. 117-148.000.

Yamaha, Mashio: *See—*
Eguchi, Fusatoshi; Okamoto, Sohei; Yamaha, Mashio; Matsumoto, Nobuo; and Yokoyama, Minoru, 3,703,963.

Yamamoto, Nobuo; and Kawaguchi, Hideo, to Fuji Photo Film Co., Ltd. Process for manufacturing photographic film having a magnetic recording stripe. 3,704,167, Cl. 117-239.000.

Yamanaka, Takashi; Miyauchi, Rinichi; Fujita, Hisaya; and Kaieda, Nobuo, to Yokogawa Electric Works, Ltd. Automatic balancing measuring meter. 3,704,415, Cl. 324-99.00r.

Yamashita, Takashi; Chida, Yugo; Ninagawa, Sadayoshi; and Kato, Tetsuya, to Ajinomoto Co., Inc. Production of acetic acid. 3,704,317, Cl. 260-533.00r.

Yanaga, Makoto, to Alps Electric Co., Ltd. Device for fixing a switch unit in a keyboard switch. 3,704,356, Cl. 200-168.00c.

Yarber, Gordon W. Pressure regulating valve with flow control. 3,704,047, Cl. 303-54.000.

Yarlott, John M.; and Gray, John C. Pneumatic press. 3,703,842, Cl. 83-524.000.

Yata, Tomio: *See—*
Hanaoka, Takemi; Kakehashi, Toshiro; Toyomasu, Ryota; and Yata, Tomio, 3,704,316.

Yokogawa Electric Works, Ltd.: *See—*
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Yokoyama, Minoru: *See—*
Eguchi, Fusatoshi; Okamoto, Sohei; Yamaha, Mashio; Matsumoto, Nobuo; and Yokoyama, Minoru, 3,703,963.

Yoshii, Hiroe: *See—*
Shiro, Teruo; Takinami, Koichi; Akutsu, Eiichi; Yoshii, Hiroe; and Yamada, Yasutsugu, 3,704,205.

Yoshikawa, Kengi; and Hayashi, Etsuo, to Sumitomo Electric Industries, Ltd. and Goshi Kaisha Yoshikawa Seimitsu Kohsakusho. Metal bearing insert. 3,704,048, Cl. 308-72.000.

Young, Edward G.; and Heggem, Howard W., to Beatrice Foods Co. Multiple layer surface working pads. 3,703,739, Cl. 15-230.170.

Young, Eugene F., to Xerox Corporation. Reflex exposure medium. 3,704,066, Cl. 355-11.000.

Young, James L., to Tubular Products, Inc. Safety device for backstop assembly. 3,704,017, Cl. 273-1.50r.

Young, Walter A. Seed planter-failure detector. 3,704,459, Cl. 340-271.000.

Zackheim, Eli A., to Silver, Jules. Teat dilator. 3,703,898, Cl. 128-261.000.

Zakharov, Sergei Alexandrovich: *See*—
Kusovsky, Boris Isaakovich; Pavlov, Nikolai Ivanovich; Matiichenko, Anatoly Petrovich; Zakharov, Sergei Alexandrovich; and Birjukov, Dmitry Anatolievich, 3,704,222.

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Zatorsky, William A.: *See*—
Foley, Edward F., Jr.; Tsai, Shan-Pu; and Zatorsky, William A., 3,704,156.

Zecher, Wilfried; Kuhle, Engelbert; and Holtschmidt, Hans, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of 3-chloro-4-methoxy-phenylisocyanate. 3,704,307, Cl. 260-453.00p.

Zeidler, Johannes, to Gutmann, Alfred, Gesellschaft fur Maschinenbau. Chamber for treating work pieces by blast. 3,703,789, Cl. 51-9.000.

Zeph, David L.: *See*—
Roeschlein, Eugene R.; Weiss, Donald C.; and Zeph, David L., 3,704,364.

Ziegler, Charles Thomas. Vacuum producing means and method. 3,704,008, Cl. 261-25.000.

Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., to Warner-Lambert Company. 4-Acyloxy-3-(3-isoxazolocarbamyl)-2h-1,2-benzothiazine 1,1-dioxides. 3,704,298, Cl. 260-243.00r.

Zitzler, Earl W.; and Ideboen, John, to Colonial Carbon Company. Apparatus for the continuous in-line production of multi-layered product units. 3,704,195, Cl. 156-250.000.

Zoecon Corporation: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF NOVEMBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Daugherty, Arthur J., to Film Corp. of America. Photographic printing apparatus for making plural assorted-sized prints simultaneously. Re. 27,527, 11–28–72, Cl. 355—46.

Deere and Co.: *See*—
Sanderson, Leon F., McCunn, and Hook. Re. 27,525.

Du Pont de Nemours, E. I., and Co.: *See*—
Nadeau, Richard G. Re. 27,524.

Emerson Electric Co.: *See*—
Schenk, John A., and Tilney. Re. 27,522.

FMC Corp.: *See*—
Looker, Olin L., and Greedy. Re. 27,528.
Maccherone, Lawrence. Re. 27,523.

Film Corp of America: *See*—
Daugherty, Arthur J. Re. 27,527.

Greedy, Edwin F.: *See*—
Looker, Olin L., and Greedy. Re. 27,528.

Hook, Richard W.: *See*—
Sanderson, Leon F., McCunn, and Hook. Re. 27,525.

Looker, Olin L., and E. F. Greedy, by FMC Corp. Method of and apparatus for harvesting vine crops. Re. 27,528, 11–28–72, Cl. 171—1.

Maccherone, Lawrence, to FMC Corp. Machine for automatically placing bags on a wicket. Re. 27,523, 11–28–72, Cl. 214—8.

McCunn, Myron L.: *See*—
Sanderson, Leon F., McCunn, and Hook. Re. 27,525.

N.V. Ingenieursbureau Voor Systemen en Octrooien "Spanstaal": *See*—
Van der Veen, Romke. Re. 27,526.

Nadeau, Richard G., to E. I. du Pont de Nemours and Co. Enzymatic determination of nitrogen-containing compounds and enzymes reactive therewith. Re. 27,524, 11–28–72, Cl. 195—103.5.

Sanderson, Leon F., M. L. McCunn, and R. W. Hook, to Deere and Company. Cotton harvester. Re. 27,525, 11–28–72, Cl. 56—30.

Schenk, John A., and R. B. Tilney, to Emerson Electric Co. System for maintaining pressure in refrigeration systems. Re. 27,522, 11–28–72, Cl. 62—196.

Tilney, Ralph B.: *See*—
Schenk, John A., and Tilney. Re. 27,522.

Van der Veen, Romke, to N.V. Ingenieursbureau Voor Systemen en Octrooien "Spanstaal". Method and device for determining the convey concentration of dredging spoil of a suspension of dredging spoil and water. Re. 27,526, 11–28–72, Cl. 73—61.

LIST OF DESIGN PATENTEES

AMP Inc.: *See*—
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Aderman, Wayne L., and C. B. Kneale, ao International Business Machines Corp. Document reader. 225,234, 11–28–72, Cl. D26—5.

Affiliated Hospital Products, Inc.: *See*—
Einstein, Alfred C., Wolff, and Moran. 225,240.

Ahlstrom, Tom E. T., and H. O. G. Ehrich. Chair. 225,198, 11–28–72, Cl. D6—78.

Akola, Henry S. Bookcase. 225,201, 11–28–72, Cl. D6—186.

American Can Co.: *See*—
Cousins, Michael A. 225,266.

American Seating Co.: *See*—
Barecki, Chester J. 225,193.

Ametek, Inc.: *See*—
Waite, Ralph D. 225,268.

Arnold, Floyd L., J. Brude, P. A. Celli, and J. R. Patmore, to Electronic Associates, Inc. Teaching machine. 225,232, 11–28–72, Cl. D25—1.

Ashton, Harold P., and J. B. Swett, to Dart Industries Inc. Grater. 225,286, 11–28–72, Cl. D89—1.

Axelrod, Barry, to Laurel Line Products. Clothes display rack. 225,283, 11–28–72, Cl. D80—8.

Bacevius, Joseph G., to Paul G. Garrity. Flashlight. 225,263, 11–28–72, Cl. D48—24.

Baker, Noel J., to Witton-James Ltd. Adhesive tab for rolls of sheet material. 225,278, 11–28–72, Cl. D59—2.

Barecki, Chester J., to American Seating Co. Airplane seat. 225,193, 11–28–72, Cl. D6—48.

Bressickello, Tony J. Refrigerated show case. 225,200, 11–28–225,202, 11–28–72, Cl. D8—8.

Becker, Kurt, to Hermann Heye. Bottle. 225,210, 11–28–72, Cl. D9—99.

Benjamin, E. Burton, to Welsh-Co. Infant's training chair. 225,224, 11–28–72, Cl. D23—53.

Benshoof, Robert E., to CBF Systems, Inc. Mobile fire detection and suppression unit. 225,220. 11–28–72, Cl. D14—3.

Berger, Joachim, Game board. 225,245, 11–28–72, Cl. D34—5.

Bixler, Kenneth D.: *See*—
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Reifers, Richard F., and Bixler. 225,214.

Braun Aktiengesellschaft: *See*—
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Bressickello, Tony J. Refrigerated show case. 225,220, 11–28–72, Cl. D6—172.

Brewer, William R., to Hamilton C. de Jong, d.b.a. Safety Brothers. Support leg for elevated toilet seat. 225,226, 11–28–72, Cl. D23—71.

Brude, John: *See*—
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Cadillac Wire Corp.: *See*—
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Cameron Athletic Corp.: *See*—
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Celli, Philip A.: *See*—
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Chase, Ascher, to General Foam Plastics Corp. Swimming pool. 225,243, 11–28–72, Cl. D34—5.

Chernow, Michael, and F. E. Yarkoni, to Monocraft, Inc. Display stand. 225,192, 11–28–72, Cl. D6—28.

Chicago Musical Instrument Co.: *See*—
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Conner, James M., to Polaroid Corp. Front panel for camera or similar article. 225,280, 11–28–72, Cl. D61—1.

Construction Specialties, Inc.: *See*—
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Continental Hair Products, Inc.: *See*—
Rizzuto, Leandro P., and Schrager. 225,284.

Cook, William J., to General Electric Co. Portable electric heater. 225,229, 11–28–72, Cl. D23—123.

Court, Jules A., to TC Products. Portable combined heater and lamp. 225,227, 11–28–72, Cl. D23—77.

Cousins, Michael A., to American Can Co. Cup dispenser. 225,266, 11–28–72, Cl. D52—2.

Craig, Mordecai R.: *See*—
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Creative Creations, Inc.: *See*—
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Culbertson, Richard, to General Electric Co. Musical instrument. 225,276, 11–28–72, Cl. D56—2.

Dallaire, Dominique and R. M., to P.H. Plastics Inc. Extruded plastic sill track for a window unit. 225,218, 11–28–72, Cl. D13—6.

Dallaire, Dominique and R. M., to P.H. Plastics Inc. Extruded plastic frame covering for a window unit. 225,219, 11–28–72, Cl. D13—6.

Dallaire, Raymond M.: *See*—
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De Jong, Hamilton C.: *See*—
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De Mandiargues, Alain P., to Parfums Guy Laroche. Bottle. 225,212, 11–28–72, Cl. D9—169.

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Diamond International Corp.: *See*—
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Disston, Inc.: *See*—
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Edgell, James E., to Disston, Inc. Upright cordless electric grass shear. 225,203. 11–28–72, Cl. D8—8.

Ehrich, Hans O. G.: *See*—
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Einstein, Alfred C., N. C. Wolff, Jr., and H. D. Moran, to Affiliated Hospital Products, Inc. Pool game board. 225,240, 11–28–72, Cl. D34—5.

Electronic Associates, Inc.: *See*—
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Firma Drabert Sohne: *See*—
Lange, Gerd. 225,195.
Foresight Products, Inc.: *See*—
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Francis, John P. Removable window case structure. 225,215, 11–28–72, Cl. D13—1.
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